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MILITARY TRAINING IN SECONDARY SCHOOLS.

By the Rev. C. G. GULL, M.A.,
Captain-Commandant 4th London Volunteer Rifle Corps,
Head Master of the Grocers' Company's School.

Wednesday, 28th November, 1900.

Major-General R. H., Viscount FRANKFORT DE MONTMORENCY, K.C.B., in the Chair.

IT was with some trepidation that I accepted a suggestion to read a paper before this Institution on the subject of Military Training in Secondary Schools, especially because the subject had already been brought before you by one who can claim a respectful hearing on any subject which he may select to elucidate, and who has had exceptional opportunities for studying the question to which I ask your kind attention to-day. I need hardly say that I allude to Dr. Warre's exceedingly interesting paper, which was read before the United Service Institution on 27th June last. But as that paper was mainly directed towards a different problem, viz., the training of officers, from that which I propose to deal with, viz., the effective increase of the defensive forces of the country, and as Dr. Warre's experience has been in a field differing in many respects from my own more humble sphere of work, I hope that it may be possible that the practical suggestions, which I desire to make, may be in the nature of a supplement to the discussion, which was commenced but hardly sufficiently developed on the 27th June.

May I say at the outset that I do not come here merely as a schoolmaster, aroused like most of my brethren by the national needs revealed in the late campaign in Africa, with the offer of suggestions based only on theory and enthusiasm, but rather as one who for many years has tried an experiment in a practical way on a fairly wide basis, an experiment the results of which, I venture to think, justify me in believing that its extension and ultimate general adoption would do much to place the defensive forces of the country on a satisfactory footing. Twenty-four

years ago I commenced my school military work by establishing a cadet corps at Dulwich College; for the last nineteen years I have commanded a six-company school battalion; and at the present time I am also in command of the 4th London, a new Volunteer corps, wholly composed of past members, or old boys, of the Grocers' Company's School.

Practically all thinking Englishmen agree that it is necessary to adopt some system by which the forces of the Empire may, as occasion requires, be rapidly and effectively increased. This common object it is proposed to attain in many different ways: conscription, rifle clubs, bicycle defenders, cadet corps, are a few of the many suggestions offered by enthusiastic but, perhaps, insufficiently experienced reformers.

Conscription would certainly be effective, but may be put on one side as unattainable. Rifle clubs and bicycle defenders are suggested by those who have perhaps drawn a too hasty inference from the partial successes gained by the Boers in the initial stages of the war. Believing that the issue of a campaign depends upon the discipline, the marching powers, and the *esprit de corps* of troops, far more than on the power to shoot straight when protected by earthworks, I have no sympathy with those who propose to assimilate the training of the British Army to the rough-and-ready methods of the Boers; but at the same time I feel that there is considerable force in the objection that is raised against the barrack-yard training of adult recruits because that training by its nature is necessarily distasteful to the majority of grown men, and consequently deters many from entering the Service.

It has always seemed to me remarkable that the Army is the only department of athletics in which early training is neglected. If you wish to make a boy a cricketer you take him in hand before he goes to his Public School; if he is to be a good rider you give him a mount in early youth; swimming is regularly taught to children; but drill, which is essentially a matter of rigid obedience, of collective practice and of mechanical precision, is generally deferred to an age when the practice necessary for the attainment for these habits either disgusts or tends to cramp the intelligence and destroy the faculty of individual initiative. In the Navy they have adopted a wiser method. They catch their recruits when young, and train them during boyhood to the required pitch of discipline.

Boys do not, in my experience, find drill training irksome; partly because they pick up the routine work far more quickly than men, partly because they more enjoy the precision and the rhythmic movements of drill, and also because their imagination is caught by the military ideal. And may I venture here to disagree with one sentence in Dr. Warre's scheme as adopted by the Head Masters' Conference—"that it is not advisable to deal with boys under the age of fifteen. To begin military drill with boys before that age can do but little good to them, and will only make them, in too many cases, dislike the idea of military service of any kind." My experience leads me to an exactly opposite conclusion. Our boys take their places in the battalion at the age of eleven. There are, I believe, officers present, who have been kind enough to undertake the annual inspection of our school battalion: I prefer to leave it

to them to say whether it is possible to give effective training at that age, and will only myself bear witness to the fact that to be promoted from the squad to the company as soon as possible is the great ambition of the youngest boys, and that the school battalion is exceedingly popular both with the boys and with their parents. In London day schools the majority of boys going in for business leave at fifteen years of age, and therefore would escape training altogether on Dr. Warre's proposition. Of course with boys so young service weapons are impossible, but a light dummy rifle made of wood serves the purpose of training and is sufficient for all but the firing exercise. The smart handling of dummy weapons in boyhood makes proficiency easy in early manhood.

It is unnecessary perhaps to labour the point that military drill and the use of arms can be, and ought to be, taught to boys. Many schemes are on foot to promote this object. Cadet corps are being formed in many Public Schools. Lord Meath is attempting to organise drill among boys of the Elementary School class, and the prejudice against soldiering has to a considerable extent disappeared. But my fear is that all these movements, which are flourishing now during the national khâki fit, will ultimately retard rather than assist the main object, viz., the *universal* training of English boys in drill, manœuvre and the use of arms, because they are all based on the voluntary principle. If statistics of cadet corps during the twenty years before the outbreak of the war in South Africa were available, it would, I think, be found that cadet corps existed in comparatively few schools, that the numbers in established corps fluctuated considerably from year to year, and that the total strength represented but a fraction of the boys in the schools. The reason for this unsatisfactory state of things is obvious. Cadet corps in the past have not been part of the ordinary school training and it is difficult to see how they can be made so in the future, because they necessarily involve expenditure for uniforms, in addition to the cost of ammunition and other incidental expenses. Consequently the military training cannot be made compulsory, and, therefore, cannot be given in school hours; and the average boy will not under ordinary conditions give up his free time to drill and manœuvre any more than the average man will think it necessary that he should join a Volunteer corps. The excellent work done in school cadet corps in spite of these adverse conditions reflects the greatest possible credit on those who have organised and carried them on; but even those who have been most successful will probably admit that success has been attained only at the cost of incessant labour, of unwearied tact, and of considerable self-sacrifice. The necessity of providing inducements which may allure recruits in the shape of marches-out, camps, shooting matches, corps suppers and entertainments, has increased the expenditure to a point which has made the financial burden considerable; and the climax of the troubles of commanding officers has perhaps been that, until within the last few years, the military authorities have rewarded their efforts with hardly concealed disdain, and have carefully abstained from giving them the smallest assistance beyond the free issue of a limited number of service weapons.

All honour to the masters in Public Schools who, under such conditions, have stuck to their work and triumphed over all the natural and artificial stumbling-blocks in their path. Dr. Warre and the Head Masters' Conference, taking advantage of the awakened patriotism of the country, have given a great impetus to the movement. The number of cadet corps approved by the War Office has increased by 64 per cent. in the present year, and there are now 79 such corps, omitting cadet battalions. But the average number enrolled does not exceed 100 per corps, so that the whole number under training amounts roughly to 8,000 boys. It is obvious from these figures that we are still a long way below the standard proposed by the Committee of the Head Masters' Conference in their resolution passed *nem. con.* on the 15th February of the present year in the following terms:—"As a step in the organisation of national defence, it is desirable that all persons *in statu pupillari* at the Universities and Public Secondary Schools, above 15 years of age, and capable of bearing arms, should be enrolled for the purpose of instruction in drill, manœuvre, and the use of arms." I do not myself believe that that standard will ever be reached through the agency of cadet corps alone. Schools differ so much in their circumstances that it is hardly conceivable that cadet corps can be universally established, or, if established, can include in their ranks anything like a majority of the boys in attendance. But the fact remains that the standard proposed must in some way be attained. The nation demands it; many school authorities are eager to realise it; the present enthusiasm has sufficient force, if utilised at once, to make the idea an accomplished fact. There is no great difficulty in the way. At the present time drill is one of the subjects of instruction laid down in the schemes of the Charity Commission, which control the majority of Public Secondary Schools in England. It is, therefore, the duty of all such schools to train boys in drill. Unfortunately there is no authority which undertakes to supervise the methods of instruction; the result has been that in many schools drill is either entirely neglected or taught to a portion of the school only; in some it is used as a punishment; in few is there any real organisation of company and battalion; the Queen's Regulations are but too often altered to the will of an ignorant and indifferent instructor. In fact, school drill is often a synonym for fancy drill, with no smartness and no interest. But the fact remains that it is at the present time the duty of Public Schools to teach drill. Head masters wish to carry out that duty, and are seeking information and guidance. Dr. Warre has told us that the Head Masters' Conference, representing 102 of the principal Public Schools, has taken action, and that 83 head masters have affirmed the principle of the resolution of the Committee. Let me supplement Dr. Warre's statement with a short account of the action taken by the Incorporated Association of Head Masters in the same direction. This Association embraces 450 Public Secondary Schools. At a general meeting held in June this year at St. John's College, Cambridge, a Committee was, on a resolution proposed by myself, "instructed to communicate with the War Office with a view to encourage schools to take their part in a system of National

Defence." The War Office has consented to receive a deputation on the subject, and a memorandum has been drawn up for presentation by the deputation. The Committee make the following suggestions :—

1. That the War Office should issue Regulations for a course of Physical and Military Drill in Schools.
2. That all schools which adopt the War Office Regulations should be inspected annually.
3. That efficient instructors should be provided by the War Office at reasonable charges.
4. That the War Office should offer to masters in Secondary Schools the same facilities in schools of instruction as are given to officers of Rifle Volunteers.
5. That the Government should furnish suitable arms for all boys over fifteen years of age, both for drill and for instruction in rifle shooting in Morris Tube ranges. Where practicable, facilities should be granted for the use of service ranges.
6. That the Government should provide ammunition for such boys on the same terms as to Volunteer Rifle Corps.
7. That the officers commanding military districts should be responsible for the military training and inspection of all schools in their districts which adopt the War Office Regulations.
8. That an Inspector-General of Military Training in Schools should be appointed.

The Committee believe that under such a system, in times of national crisis, the home army of defence could be rapidly and effectively increased.

The broad principles underlying these suggestions are: first, that every school should exercise its discretion as to accepting the War Office regulations and inspection; but that all boys in the schools, which do accept, should go through a regular training in military drill and in shooting as part of the ordinary work of the school. No Act of Parliament would be required. A simple transfer of authority from one Government Department to another is not a very serious change; but to hand over the inspectional powers with respect to drill from the Charity Commission to the War Office would result in a great increase of efficiency, if the necessary organisation were provided and well maintained.

It will be observed that no mention is made in the Committee's suggestions about uniforms. It is absolutely necessary that the provision of uniforms should be left optional. The object in view is not to make soldiers, but to give to all boys a military training of such a character as to enable them to take their place in the ranks in after years with but short preparation. This can be done without uniforms. As a matter of fact, the chief training of the smartest Volunteer corps is done, not in

uniform, but in civilian clothes. The time has gone by when that work can be regarded with more or less benevolent toleration; if in the best Volunteer corps the work can be done and the training given in civilian dress, uniforms are still less necessary for the training of boys, because in all Public Schools the school cap, the Eton collar, and the black jacket, taken altogether give sufficient uniformity for ordinary drill purposes, and even for ceremonial. The object of uniform in the present day is not so much to promote efficiency—our troops in Africa have not been remarkable for the smartness or correctness of their attire—but rather to act as a recruiting influence, an appeal to vanity. This object, undoubtedly necessary in our system of recruiting, both for Regulars and for Volunteers, would be *ex hypothesi* unnecessary, because all boys of sufficient health would, in the ordinary school course, be put through the training. No inducement would be necessary. On the other hand, to insist on uniforms in school training, or even to represent their provision as a counsel of perfection, would at once stop many schools from adopting the scheme and placing themselves under military supervision. Take my own school. We have always been able to put between 300 and 400 boys into line. If we attempted to enforce uniforms, I doubt whether we could put 100, unless the whole cost of their provision were thrown upon the school or the Government.

The suggestion of the Committee of the Head Masters' Association as to the issue of *regulations* by the War Office for a course of physical and military drill in schools might, with advantage, be met by the issue of a single red book, containing all that was necessary to be learned and practised both in drill and in musketry for the school course. It would be necessary to start with a clear idea of the definite amount of work to be required; this would probably be limited to the chief sections of squad, company, and battalion drill—that is, roughly, the first hundred pages of the present Infantry Drill—together with the manual and firing exercise and a simple course of musketry instruction. Thorough practice in physical drill, and especially in free gymnastics, is already given in many schools which have not hitherto aimed at military drill; it is invaluable, and should form a prominent part of the school training.

In order that the scheme proposed may be carried out with success, it is essential that great care should be taken in the selection of sergeant-instructors. Most adjutants of Volunteer corps have had experience of the difficulty of securing the right men for these positions; it will be even more difficult to select instructors for schools, because they will be necessarily under less supervision, and, therefore, in a position of greater freedom and responsibility; and at the same time they will have to meet difficulties which do not confront them in an ordinary Volunteer battalion; the vivacity of some boys, their love of mischief, their aggravating power to torment, will call forth all the tact and the firmness of their instructors, and will test their ability to arouse the enthusiasm for smartness, which is so essential to good work on the parade-ground. At the same time, for Army pensioners who possess the necessary

qualifications and character, the position of Public School drill instructors will be an excellent employment. The pay should be fairly high in order to attract the best men, the school contribution supplementing the pension.

But if military work in schools is to be successful, it must not be left entirely under the control of the sergeant-instructor class. Every inducement should be held out to assistant masters to take an active and efficient part in the training. There will, I think, be little difficulty here; in all large schools one or more of the members of the staff have been members of a Volunteer or of a cadet corps; to secure the co-operation of such men they should be recognised in the Army List as subordinate officers, and should have every facility given them in the schools for officers to make themselves thoroughly efficient. There would appear to be no reason why such men should not be allowed to attend schools on precisely the same conditions as the ordinary officer of Volunteers, without cost to themselves; it might be possible, to meet the conditions of a schoolmaster's life, to arrange a military school for the month of August in a camp situated perhaps in an attractive position on the coast, so that schoolmasters might combine their military training with their summer holidays.

A sufficient number of these trained officers should be appointed to ensure general supervision of the work of the instructors, and to take the place of the commanding officer and field officers in battalion drill; in my experience it is far better to appoint the company officers and the non-commissioned officers from the boys; the work is thus made more interesting and more instructive, while the hope for promotion acts as an incentive to smartness on parade; a few skeleton drills will make boy-officers quite at home in their work.

The organisation within the schools, which I have ventured to sketch out, would be gathered up and controlled by the district organisation, the officer commanding each military district being responsible for the military instruction in all schools, which adopt the scheme. He would select the sergeant-instructors, inspect the results of their work, and generally inspire and control the officers appointed. He would also be responsible for arranging the instructor's visits in smaller schools, which would not require the full service of an instructor, and he would make arrangements in conjunction with head masters of schools for combining a group of small schools for battalion purposes. To complete the organisation, an inspector-general of military training in schools would be necessary, so that a uniform standard of work may be maintained and a grip may be kept by the War Office on the whole system.

There are not a few reformers at the present time who regard rifle shooting as the sole training required for an army of defence: it should at least form an important part of that training and should be included in the school course by the aid of Morris Tube ranges. Where possible these ranges should extend to at least 50 yards, although good practice

can be had at a much shorter distance; at the longer distance the difficulty of straight shooting is as great as with service weapons on the ordinary ranges, omitting, of course, the effect of wind; good shooting on the miniature ranges is almost a preliminary necessity for success at the targets. Personally, I should like to see the miniature ranges used also for collective practice, in order that fire discipline might be early acquired, at least by sections; but this would involve extra expense in the provision of rifles fitted with Morris Tubes. The Government might be expected to provide both weapons and ammunition on a scale sufficient to ensure real proficiency in all boys of fifteen years of age. In this way rifle shooting would in a few years become a national sport.

I venture to suggest to you that the scheme proposed, if it should be adopted by the War Office, will be both effectual and cheap. The expenditure of the Government would be practically limited to the cost of rifles and ammunition, with possibly a slightly increased staff in the district offices. That it would be effectual I cannot doubt. The ordinary recruit is supposed to become a trained soldier after a three years' course. There is no comparison between the aptitude of a boy for drill and manœuvre and that of the ordinary recruit; moreover, the knowledge and habit acquired in early days become part of the character and cannot be forgotten. Lord Roberts has declared that the training given to boys will make them as efficient for service in after life as is the average reserve-man when he rejoins the colours.

Certainly the ease and steadiness with which well-trained boys take their places in the ranks in after years would surprise those who have not witnessed it. The recruit stage does not exist for such men. If such training became general, the nation would receive a great accession of strength. The present is a splendid opportunity; the schools are, I believe, ready to fall into line; a little hearty encouragement and organisation on the part of the War Office are all that is needed.

I thank you for the kind attention you have given to me. If I have been tedious, I regret it. I can only plead that I am urging upon you a scheme which I have tried fairly and practically for many years in my own school, and its general adoption would, I believe, in a few years do much to free the Empire from any return of those forebodings which chilled so many hearts at the end of last year.

Lieut.-Colonel T. H. Baylis, Q.C. (late 18th Middlesex V.R.C.):—Being one of the oldest Volunteers and, unfortunately, the only member of the Council of this Institution present, I venture to open the discussion. The subject of this paper is most interesting, instructive, and opportune. Military training has its special advantages physically. Drill is of essential value, it opens the heart, it expands the chest and lungs, it improves the figure and carriage, and increases the muscular power. Mentally it encourages manliness. It teaches the duty of obedience, both in obeying and being obeyed. It is more easy to obey than to insist on obedience, which requires patience, firmness, intelligence, and self-reliance. Even Her Majesty has had her children trained physically and mentally, to which is due their excellent carriage and superior demeanour. The lecturer will be glad to hear that the City of London

School is going to establish a cadet corps. The lecturer is moving in the right direction in urging the advantages of military training in schools. From his long experience as a head master and Captain-Commandant of the 4th Battalion Volunteer Rifle Corps, his remarks are entitled to great weight. I approve of the use of dummy rifles and bayonets with cadets, they like them, and the drills they require. What little boy does not like a toy gun? When Field-Marshal Sir Lintorn Simmons inspected and highly commended about 1,200 Church Brigade boys, most of them were boys between 12 and 16 years of age, and had dummy rifles. Not long since I inspected at Kingham, Oxfordshire, and in Paddington, boys with dummy rifles, who went through their firing and bayonet exercises with precision. I presented the latter with additional dummy rifles. As to uniforms, I drilled in plain clothes; I could not otherwise have attended drills. Although in some well-to-do schools, as at Eton and Harrow, they have uniforms, they are not essential, and are too expensive for ordinary schools. A sufficient uniformity may be obtained by belts and caps. There is a certain amount of attraction attaching to uniforms. The Horse Guards and the Life Guards in their fine uniforms may induce some to join, but they put on khâki when they went to South Africa. If we were to build a lot of fortresses round London, if insufficiently held they could be taken by the enemy, but if sufficiently held they would require a large muster of troops, which would detain them from service in the field. Boys on an emergency could line our hedges and ditches less visible than men. The strong man armed keepeth his house until a stronger man cometh. We shall be stronger by the military training of boys. I hope we shall all give our support to this movement, which will be of advantage not only to the boys but to the country at large.

General J. H. DUNNE, (Colonel, the Duke of Edinburgh's, Wiltshire Regiment):—As I am going to dine with the Grocers' Company to-night, and noticed that the reverend commandant and head master of their schools was going to give a lecture here to-day, I came to hear it; and in case I have not the opportunity amongst the Grocers themselves of complimenting Mr. Gull on his admirable lecture, and for the endeavours which he has shown forth in his paper to make the country an armed nation, I do so now. It is my firm conviction that it is impossible that England can be prepared to meet the attacks likely to come against her unless we get rid of the species of bogie connected with the word "conscription." I take exception to the lecturer's remark, in which he says, "Conscription would be certainly effective, but it may be put on one side as unattainable." Conscription may be impossible in the way that conscription is carried on in the Armies of Europe. But are we satisfied that certain schools like that over which Mr. Gull presides should be carrying on the drill which will enable the boys in after life to take a part in the defence of the Empire, while *other schools do nothing?* I say that every single youth from a certain age should be compelled by Act of Parliament to learn to bear arms, and after he has been taught he should give a week annually to continuing his knowledge of the drills to enable him to be of service, in case of emergency, for the defence of the Empire *at home*. I am, therefore, thoroughly in accord with the lecturer in thinking how excellent a thing it would be for all our schools to adopt the regulations he mentions. I quite agree with the broad principles underlying the suggestion, and the interests which the War Office should take in it. I say that the country will have to open its purse, it will have to supply the Volunteers in a very different way than they have ever done before; and, if it wants to make England an armed nation, it will have to carry out Mr. Gull's principles far and away more than he has advocated here. The boys in every school will have to be taught how to bear arms, so that when they reach a certain age, after a short amount of service, they will be ready in case of emergency. Why should not every boy who is provided with free education by the country give a certain amount of service afterwards to the country? I say that every young man who wishes to be exempt from military

duties for the purpose of taking Holy Orders, or anything else, should be made to pay a certain fine for his exemption, to go to the credit of the Army Estimates; and I would not have any purchasing of substitutes, but it should be made compulsory that every young man in England gives a certain amount of service to his country—either in the Regular Army, the Militia, the Yeomanry, or the Volunteers, or special corps raised for elementary instruction in every district. Now is the time to do such a thing, when the whole of the country has become thoroughly imbued with military ardour through the war in South Africa. And why should it not be done? It was a pitiable sight to see all those loafing fellows in the streets on Mafeking night. And over and over again in the large towns, during this last year, it was a sight to make any old soldier weep to see hundreds of coarse boys, loafing young men, and elderly hooligans cheering and shouting "Soldiers of the Queen" without showing the slightest disposition to risk their good-for-nothing skins in the service of their country! I would make the instruction of drill compulsory in every school throughout the United Kingdom.

Major A. SOMERVILLE (4th Eton College V.B. Oxfordshire L.I.):—The lecturer has referred several times to Dr. Warre, and has also read a letter from him. Dr. Warre wished me to come here and express his very great regret that he cannot be present to-day. He also wished me to emphasise the fact that there is not the slightest difference between his views and those of the lecturer. The lecturer quoted a passage from Dr. Warre's recent lecture before this Institution in which he spoke of military drill not being taught to boys under fifteen, but Dr. Warre draws a very clear line between such cadet corps as those the lecturer has done so much to start, and the corps which are formed in the larger Public Schools in the country where boys do not leave before the age of nineteen. Dr. Warre's object, as some of you may possibly remember, is to form these Public School corps into instructional corps, as nurseries for future officers of Volunteer corps throughout the country, and also for the Militia. It is gratifying to find that the views of the lecturer and Dr. Warre are completely in accord. To my mind, it is a most hopeful sign that these corps should be established; and I would go further and say that it is a most necessary thing that they should be established. It is necessary, both from the point of view of national defence, and from the point of view of national physique. General Dunne says that we must avoid the word "conscription." Of course, we know the general sense of the country is against conscription; I am against it myself; but it is quite impossible to blind ourselves to the fact that Continental nations do receive very great benefits from conscription. I do not mean merely in power of defence or offence, but in the point of bodily physique. Those of us who have lived abroad have seen the Frenchman and the German manifestly improved by the time they have spent with the colours. Lord Rosebery, in one of those luminous remarks which are so characteristic of him, recently said: "An Empire must be pillared upon an Imperial race, and we are not breeding an Imperial race in the slums of our great towns." It seems to me that the corps that are now being formed by Lord Meath, Mr. Gull, and the officers of the Church Lads' Brigade, are doing a great work for the country, and, in the course of time, the physique of the country will be improved by them. Therefore, I think, we should regard them as a matter of great hope for the future of our country. The schools generally are approaching the Governments and their executive, the War Office, saying that as the task is too great for any private body or profession, the question should be approached by the War Office in a sensible, broad, and sympathetic spirit; and they ask the Government to take advantage of the vast quantity of material to hand; to take advantage of the spirit that is now prevailing, and to organise that material, remembering that the boys of to-day will become the men of to-morrow. I think that a very long step would be taken, both towards improving our national physique and towards placing our national defences on a thoroughly business-like footing, if that were done.

Major A. C. YATE (The Duke of Connaught's Own Regiment of Bombay Infantry, 2nd Baluch Battalion):—I cannot speak as an expert in this matter, for two reasons: because it is well-nigh 30 years since I left school, and there were no cadet corps then, at any rate in my own Public School; and because I have since then been mostly in India, and, consequently, not much in contact with Public Schools. At the same time, the idea of military training in schools has long been familiar to me. It came into my mind, first ten years or more ago, when I was visiting Roslin Chapel, near Edinburgh. As I went through the town, I came across the village shoemaker drilling a squad of the village National School lads. It struck me then that what that man could do—he was a retired soldier—might be done (and very possibly was then being done unbeknown to me) in many English, Scotch, and Irish villages. Indeed, at a later period, in another village close to Edinburgh called Colinton, I found a young Sandhurst Cadet drilling the village boys. I should have liked to have ventilated that idea at the time in *Blackwood's Magazine*, and I remember speaking to Mr. William Blackwood on the subject. However, he did not think then that it was of sufficient importance, although I rather incline to think that to-day he would. It has become a matter of national importance. When Dr. Warre gave his lecture here six months ago, I made a point of being present, as I made a point of being here to-day. I think it will be generally admitted that the first duty of a citizen is not to himself so much as to the State, and it is on those grounds that I contend, and agree with those who contend, that military training in our Secondary Schools should be compulsory; despite the fact that the feeling of boys, parents, and masters are alike in favour of it at this moment. I do not believe there was a single Public School, at the speech-day of which, last July or August, the head master did not state with pride the number of boys of that school who had served or were serving in South Africa. The same feeling animated humbler schools. One which the Duke of York inspected was proud in having sent 400 or 500 lads to South Africa. I took up the *Saturday Review* the other day, and I saw that 2,597 boys brought up in the Reformatory Schools of England had served out there, that one of them had got a commission, and I further gathered that one or two of them had won the V.C. or the Distinguished Service Medal. Add as another instance the Newport Market Refuge and Army Training School, which has already put some 700 boys—originally destitute lads—into the Army, 200 of whom have been or are serving in South Africa. These facts are pretty strong arguments, I think, in favour of what schools—both schools of the primary and secondary class—may do to train our soldiers. It is impossible in this connection not to think of the Duke of York's and the Royal Hibernian Schools as training grounds for the humbler ranks of our Army. When the question of uniform comes in, it occurs to me that the boys at the Duke of York's School, as far as I remember, drilled, at their annual inspection, in flannels, and not in uniform. I think the question of uniform is not a highly important one, and should be left open. Another point that seems to invite attention is, why our officers and soldiers fail to show at the commencement of a campaign that familiarity with the conditions of the war on which they are entering which they should do. The cause seems to me to lie in this, that the national life is against our youth getting the requisite training, I mean a training similar to that which the Boer gets on the veldt, the backwoodsman "out west," and the colonial in the colonies. There is no doubt that the lives these men lead teach them an infinity of things which our young men of all classes cannot learn, brought up as they are in towns, and under essentially domesticated conditions, which do not develop the acute powers of observation and do not familiarise them with danger. This, I think, is a point with which we must deal in our military training in schools, and I would, therefore, suggest that that training should be not mere drill, but largely out-of-door work, for the purpose of cultivating the powers of observation and of inference from what is observed. Baden-Powell's "Hints on Scouting" is the best *vade-mecum* I know. It certainly taught me a great deal of what a man may do by exercising his powers of observation and inference from

what he observes. I say that the development of that power is an important factor in the military training of our youth. I am very glad to notice that, in continuation of the work which is now being done by the Public Schools, the Universities (Cambridge, certainly, if not Oxford) also are taking up military training most earnestly. I look to the Universities to furnish that supply of instructors among our Public School masters, who will undoubtedly be required to carry on military training in Secondary Schools. We look to our Public Schools to educate and train for us a strong reserve of officers. It is well known that in this South African War the casualties among the officers have been three times as many as those among the men, in proportion to the numbers engaged. That gives us at once an idea of the very large reserve of officers that we require ready for the service of the country. It must be relatively much more numerous than the reserve of soldiers. Our Public Schools can help us to solve this difficulty. One word about military history, which is surely a subject that our Public Schools might teach. When I was at school I learned a little Greek and Roman history, and possibly in that Greek and Roman history there may have been a smattering of Greek and Roman military history, but I can honestly say that there was nothing of *British* military history. That is what the English boy wants to learn. It is a knowledge useful nowadays to men in all professions, when men of all professions take a deep interest, if not an active part, in the Army. To our statesmen the knowledge is essential. Above all it is sorely needed by our journalists—the men who accompany our armies into the field, and mislead the nation with their erroneous criticisms and ignorant exaggerations. Just one word about rifle training. A book was put into my hand the other day, entitled "Pen Sketches from a Vanished Hand," by Mortimer Collins. In this little work, written, I think, 30 to 40 years ago, I found this passage :—"Why should not every Englishman to-day be a rifleman, as he was a bowman under the Plantagenets? What would Dr. Cumming say to this as a prophetic suggestion?" Such were Mortimer Collins' words. I think this little prophecy of his looks more likely to come true than anything Dr. Cumming ever prophesied.

Colonel J. A. FERGUSSON (late Rifle Brigade):—We ought to lose no opportunity of pressing on our fellow-countrymen the primary duty of every able-bodied citizen qualifying himself to take a share in the defence of the country. I have read and re-read this lecture, and rise not to criticise, but to humbly commend it. I heartily concur in every word of it. It would be of great value to our boys, not only in Secondary Schools, but also in Primary Schools, if they were taught drill as part of the regular curriculum. I am the last to decry the valuable and noble labours of the masters of our Public Schools in the past, but I do not think, except in this time of war, that soldiering in our schools has been popular. The reason is that a boy by joining a rifle corps was apt to lose his chance of getting into the school eleven. He necessarily was unable to practise games as before ; and the drill was done in his own time, so that whatever his tastes were they had to be put on one side in favour of the drill. If we could only have the principle recognised that drill is a necessary part of education, I think a very great step would be made. Then habits of discipline are so invaluable. True, the physique of the boys would be improved by the drill. Boys are apt to get as girls are, something like curvature of the spine, by always leaning over desks. It would do the boys' physique an infinite amount of good if they were drilled systematically, every one of them. Habits of discipline are so valuable, whatever a boy is going to be ; even supposing he is going to be a clergyman—and I am not at all sure that clergymen are not the very people who want most to learn the habits of discipline—habits of instinctive unquestioning obedience to their C.O., their bishop, or whoever their commanding officer is. A good deal of ridicule was thrown upon Lord Salisbury's scheme of village rifle ranges. I should like respectfully to say that I think the Prime Minister's suggestion was invaluable. If we could have rifle ranges within easy reach of every town and village it would be going a long way to make rifle

shooting popular. We see now every Saturday all over the country thousands and thousands of young fellows crowding to look on at twenty-two men play football. The interest in manly sports is a good thing, but how few of those who go to football matches play football themselves! If we can get everywhere the same interest taken in rifle shooting—the same keenness and competition in rifle shooting we see now in football—it would be a very great gain to the country. I cordially agree with Mr. Gull, as I said after Dr. Warre's lecture, that uniform ought not to be made compulsory. At Eton and Harrow and so on I do not think they count the cost very much of clothes, but in humbler schools it is a very serious consideration when parents have to put their hands into their pockets and furnish uniforms. That it is quite unnecessary has been proved by the Church Lads' Brigade. They look very smart, and they have only just a belt and cap without any uniform. Another point which I think Mr. Gull is very right upon, is the necessity of great care in the selection of the instructors. There are plenty of deserving old non-commissioned officers and warrant officers who would be the very men for the post, but there are plenty, too, who are out of work for different reasons who would try and get into these billets. The greatest care should be taken in the selection. Only the smartest men should be taken, only good shots and men of high character with plenty of tact, who would make, as Mr. Gull himself has succeeded in making, drill popular with the boys, so that after they left school they would go on to the Volunteers. I do not think there are any other points that I need detain you upon. The lecture has been very well timed. The hot fit may be passing off, perhaps the cold fit is coming on; but the attitude of the country at this moment is one of calm determination. There is a much more general feeling than our statesmen have any idea of that it is the duty of British subjects to be ready in case of need to take part in the defence of the country. The word "conscription" ought never to be mentioned. I do not know anybody who is in favour of conscription; but universal service either in the Volunteers or in the Militia, with the view of qualifying a man to take his share in the defence of the country, ought to be looked upon as the duty of every citizen.

Colonel H. H. A. STEWART (late Donegal Artillery, S. Division R.A.):—Colonel Fergusson has anticipated me in the observations he has made, namely, that in order that the scheme proposed may be carried out successfully it is essential that great care should be taken in the selection of sergeant-instructors. No doubt, my lord, that is a most important point, and it is one on which the lecturer himself lays particular emphasis. But Colonel Fergusson did not offer any suggestion—at all events, if he did, I did not hear him—as to how these efficient and highly-trained instructors are to be obtained for the schools. I speak with thirty-five years' experience in the Regular Army and in the Militia, as an adjutant in the Regular Army (in the infantry) for six or seven years, and as a commanding officer of a Militia regiment. Now I know uncommonly well—and I have no doubt there are many here who will corroborate me—that even in the Regular Army there is great difficulty in obtaining the services of thoroughly trustworthy and efficient non-commissioned officers. I can also speak from my own intimate knowledge of the Militia, in which I commanded a regiment for seven years, and left only recently. I know there was very great difficulty in getting efficient non-commissioned officers for the permanent staff of the force; but do not take my word for that. I give you the opinion of a well-known commanding officer of Militia, the late Colonel Walker, of the Scottish Borderers, and he has, if I may say so, received the *imprimatur* of the present Commander-in-Chief for everything that he ought to be as a soldier and as a Militiaman. What did he say? He said in a lecture delivered in this Institution some years ago that it appeared to him that the notice might be posted up on every Militia barrack gate: "Rubbish may be shot here." To a great

extent I can corroborate that.[1] After the Militia—but in another degree of comparison—come the Volunteers. I know from many commanding officers of Volunteers, from many adjutants and many officers of the force, the extreme difficulty they experience in obtaining good and reliable non-commissioned officers as instructors from the Regular Army. When we go to a lower stratum, if I may say so, in getting non-commissioned officers to train the schools, where are they to be found? Throughout my experience the demand for instructors from the Regulars has always exceeded the supply of suitable non-commissioned officers. Yet this demand is certain to largely increase for the Auxiliary Forces alone, and, setting aside for the moment the schools, the crux is, how is this demand to be met, and with the least delay. If I may offer a suggestion, it is this, that the pay of the *non-commissioned officers* of the Army must be raised; you will then get a better class to enlist.

The Rev. C. G. GULL, M.A., in reply, said:—I only wish to say, my lord, that I am exceedingly glad to find so much unanimity upon the subject. The chief object of my lecture was to ensure that boys should not be shut out from drill because they were not members of cadet corps. Personally, I like cadet corps, and I have done some work in them; but I am certain that if boys' drill is confined to the cadet corps you will shut out a very large class of boys—whole classes of boys—and also a considerable fraction of the upper middle class, who will prefer not to take drill if it is at any cost. I am anxious that this scheme of the Head Masters' Association should be backed and supported, and, I hope, finally accepted, by the War Office. All other schemes that are at present being arranged for similar objects, of course, have my hearty sympathy. I have done as much as I could to try and get good drill in some Primary Schools. I cannot understand why schools where boys have their education absolutely free at the cost of the country should not be compelled by Act of Parliament as a matter of course to undergo proper military training.

General DUNNE:—And to give a certain number of years' service in the Army afterwards.

The Rev. C. G. GULL:—That is a point which, as a schoolmaster, I am not so much concerned with. I am much obliged to you for the manner in which you have received my paper.

The CHAIRMAN (Major-General Viscount Frankfort de Montmorency, K.C.B.):—We have listened to Mr. Gull's paper on Military Training in Secondary Schools with great interest, and I venture to take this opportunity of thanking him on your behalf for such a practical paper. He speaks not only as a schoolmaster who understands the feeling of boys, but also as a commanding officer of a corps where he knows what can be done with boys through school training. Well, that is a great subject; it may well be considered a national subject. It should not only commend itself to all parents and guardians for the physical benefits their sons would get, but it should be considered essential for all to be ready to uphold the honour of England should any nation or combination threaten our Empire. There is no doubt that boys pick up instruction quicker than adults, and find it less irksome. If it could only be understood that it was the bounden duty for all to be ready to take part in the

[1] At a discussion in July, 1893, at the R.U.S.I., I showed that during the training of my Militia regiment—then just concluded—the proportion of men sick throughout the twenty-seven days was *fifteen-fold* greater amongst the permanent staff than amongst the Militiamen; again, the proportion of prisoners of the permanent staff was *five-fold* greater as compared with the Militiamen during the same period. Yet, the permanent staff are soldiers of the Regular Army selected to instruct the Militia. In face of such facts, what chance have the schools of obtaining the desired class of instructors—at all events for some considerable time to come?—H. H. A. S.

defence of the Empire when called upon, drill of some kind would be considered an essential part of a boy's education, and would at once be made obligatory in all schools. Special cadet corps and battalions have been started in many schools with the most satisfactory results. The boys like the drill. There is no difficulty in getting good instructors from the Regular Army, or, what is better still, from the teachers themselves; but to encourage this movement and keep it in a satisfactory position, something must be done to make military drill an obligatory portion of ordinary school training. In forming corps, one most important thing is the question of expense. Mr. Gull says he does not consider uniform necessary, that the provision of uniform should be left optional. The object is not to make soldiers, but to give boys a military training of such a character as to enable them to take their place in the ranks in after years with short preparation. Now, that is absolutely sound, nobody in the Empire can take exception to that. It is our bounden duty to be ready to take our place in the ranks, either young or old. Of course, this drill can be done without uniforms, but there are expenses which cannot be dispensed with, such as instructors, arms, and ammunition; and I am convinced that if cadet corps formed in schools and the natural outcome of military drill are to be a permanent success, the Government must come to their support. There is no doubt that some schools could get on without Government assistance, but that is not the question. This movement should be universal. We must not forget the poorer schools and the difficulty they would have to contend against. They would be perfectly unable to start camps and shooting matches, which are all encouragements for the boys to get on, and they would be handicapped; in fact, they would be out of it altogether with the richer schools. If the Government will give a grant, or if the Government will agree with the memorandum which was drawn up by the meeting at St. John's College, or if they will give a grant and a certain portion of ammunition, rifles, and lend ranges, there would be no difficulty, or very little difficulty, in making this movement a splendid success, at any rate it should not be allowed to depend upon voluntary contributions. I must say that up to this the Government have taken very little interest in this movement; I might also say they have damped it, they have thrown cold water on it. Out of certain requests made by Lord Meath, the Chairman of the Lads' Drill Association, the War Office have only acceded to two, firstly, the granting of substantive commissions to officers in cadet battalions; and, secondly, they have sanctioned a simpler uniform, which does not cost them anything, for the cadet corps. I do not touch on the subject of organisation or on the subject of corps being affiliated, or attached to Volunteer battalions, or upon the subject of regulations for the guidance of cadet battalions, because I think those matters are better left to the schools in the first instance. The greater the freedom the greater will be the interest. If the movement develops and becomes permanent a uniform code of regulations will be necessary; but to make it a success it will be necessary to make military drill one of the obligatory subjects in all schools. The Government must take an interest in the movement, and grant assistance, for without it, it would be unwise for poorer schools to start corps depending on voluntary subscriptions, which might fall off at any moment, and masters should not be expected to go round with the hat for money to support an Imperial question. We must look at this movement as our duty to our country; we must look at it as a national duty that we are all ready for the ranks on a sudden call, and the drill learnt at school would enable us to take our places in the ranks with a short preparation. From these remarks you will see that I have treated this movement as in its infancy. It has made a good start, thanks to those masters who can look ahead. But I look upon it as a part of the Imperial Defence question. This cadet movement has been already started, I am glad to say, in some of the Colonies with Government aid: but it is absolutely necessary, in order to make it permanent and universal in this country, that it should be recognised as an Imperial question by Her Majesty's Government.

ARMOUR, AS AT PRESENT APPLIED; AND ITS BEHAVIOUR IN ACTION.

By Captain C. ORDE-BROWNE, late R.A.,
Lecturer on Armour, Ordnance College.

Wednesday, 4th April, 1900.

Admiral the Right Hon. Sir JOHN C. D. HAY, Bart., K.C.B., D.C.L., F.R.S., in the Chair.

SINCE I had the honour of reading a paper in this Institution on Armour, such fundamental changes have taken place in the character of the actual substance of the armour plates that it may be well to devote a few words to this before dealing with the part played by armour in action.

I spoke of the entirely different character of the coast shields adopted by England and other Powers, which I classed as soft and hard armour; the former then and still is in a great measure represented by wrought-iron, and the latter by Gruson's chilled cast-iron. Old-fashioned as these are, they still constitute the bulk of the coast defences everywhere. My reason for noticing these is to illustrate the opposite nature of their behaviour: our soft plate upon plate armour yielding wholly by perforation without fracture, and the Gruson yielding wholly by fracture without the possibility of perforation. Perforation and fracture are alike affected by the striking energy of the shot, but in the former a hole is made which requires energy in proportion to its size, that is to say, the smaller the projectile the more easily it gets through; whereas fracture depends simply on the total energy, supposing the projectiles not to break, or all to break equally easily. Thus, for example, for some time on board the "Nettle" were two guns, a 6-inch new type and 10-inch old type piece. The energy of the 10-inch blow was about double that of the 6-inch, and it would probably have done about double the work in fracture on hard armour. On the other hand, owing to the larger diameter of the heavier shot, the two guns had about equal power of perforation. As the work of fracture as well as perforation comes into play in destroying armour, this great difference in their law of action should be kept in view. Tables sometimes show perforation as if it were the only measure of power. This I illustrated once before here, and now illustrate again, with a dropping weight, into which are screwed projectiles of different diameters; but the total weight is kept uniform. It will be seen that to perforate mill-board, the weight must drop a height proportionate to the diameter of shot screwed into it, while to break the

brick slab the same height produces the same effect, no matter what diameter the shot is.

I want now to pass to a question of the method of perforation. In late years steel armour has come in with a face hardened to some depth by cementation and further surface hardened by water, and so successfully has this been accomplished that the best projectiles are seldom able to retain their sharp form of head on impact. When they get through, they generally do so with a head set up and deformed. This may be termed the defeat of "boring" and the substitution of "punching." Boring with a tool consists in getting a sharp point through any substance and then opening the hole outwards to the full size required to let the boring tool pass through. This is the easiest means of perforating a substance, and sharp-pointed shot has thus acted on armour. If, however, the sharp tip of the point is broken on the hard plate face, the head is liable to be set up and deformed, and the shot, instead of getting its point through and tearing the plate open radially in a star, drives a disc out in front of it. The mill-board does not punch out well, but you can see that the height of fall that drives a pointed shot through by boring, fails to get this flat-headed one through, thus illustrating the advantage gained by the hard face in destroying the point of the projectile. This diagram[1] shows a plate of Beardmore's, and you will see in the back view that No. 7 shot was coming through by boring, another has attempted it less completely, while the remainder are obviously set up and driven to punching. This first shot, No. 7, had a cap on its point, and illustrates what I believe is the function of a cap, namely, the preservation of the sharp point of the shot on first impact. Occasionally it will be found, but very rarely, that an uncapped shot behaves quite as well as a capped one, because its point has not snapped, perhaps because its entrance has been unusually direct. Speaking generally, however, caps offer the advantage I have endeavoured to illustrate in approximately direct firing, in fact, up to 20° with the normal or direct line. Beyond that angle it is doubtful if they are of any use. Hence the hesitation to adopt them.

A very subtle illustration of the scope of action of the hard face skin occurred at Texel in 1898. Six plates were tested competitively; five were face-hardened, and the sixth, from St. Chamond, was not. The first round was delivered at each plate with 1,441 foot-seconds striking velocity. To the surprise of probably all present, the shot penetrated least deeply into the St. Chamond plate. As the velocity was increased, however, the shot began to break up against the hard-faced plates, and to get deeper into the St. Chamond, the Vickers plate breaking the shot up round after round with about the same penetration that the first-named had achieved with its low velocity, while it passed clean through the St. Chamond. This is probably to be explained by the fact that the St. Chamond plate was harder than the body of the others, and until the velocity rose the hard skin on the face had no effect.

[1] In consequence of the death of Captain Orde-Browne since his lecture was delivered, it has been impossible to procure the diagram to which reference is made.—ED.

One word on our present armour. The Krupp process plate, like the Harveyized, has a hard face, but it has a greater toughness, and this helps it, especially in the case of thick armour. Perforation tells fairly proportionately on thick and thin plates, though doubtless the thick are more troublesome to make well. That is to say, a 12-inch may perforate a 12-inch plate with not far from the same velocity as carries a 6-inch shot through a 6-inch plate. Fracture, however, tells much more against thick armour, and the reason is obvious. Fracture is resisted in proportion to the width of plate to be broken across, and thick and thin plates, far from being proportionally wide, often do not differ very greatly in width. Suppose, then, that a 6-inch plate 8 feet wide is attacked by a 6-inch shot. Fracture here is attended by the sudden entrance of a conical or conoidal 6-inch wedge. Suppose that a 12-inch plate is attacked by a 12-inch shot. The perforation, as above said, will be nearly under the same conditions as in the case of the 6-inch, with shot of similar proportions, for the projectile has a diameter equal to the thickness of the plate ; but it is quite otherwise with fracture, for the plate may be only 10 feet wide. Indeed, I am taking approximately the dimensions of actual Krupp plates in a notable trial in 1895. Now, observe, this plate, 10 feet wide, is attacked by a 12-inch wedge—that is, a wedge one-tenth of its width ; whereas the 6-inch plate, being 8 feet wide, was attacked by a 6-inch wedge, only one-sixteenth of its width. Hence it will be found that thick plates break across more easily than thin ones under attacks involving proportional perforation, so that toughness is more in demand for thick armour than thin, and here Krupp plates show to the greatest advantage.

The Krupp process of manufacture which produces these good results is a very remarkable one. It is no doubt subject to variation, and since it has been adopted in this country each maker has improved and modified it, indeed there is an inclination to cease to call their plates Krupp armour. So long, however, as the very characteristic features of the process obtain, it appears to me misleading and ungracious to do this. These features, as I understand (for it is by no means easy to see the operations), consist mainly in the use of chromium to such an extent that great brittleness and hardness might be expected. Sudden cooling is carried out in a way that might be expected to ruin the metal, but the result is great toughness. It must be understood, however, that nickel is also used, and nickel has long been known to give toughness in a remarkable degree.

Whatever name may be given to it, however, our Sheffield makers have admittedly so successfully developed the manufacture of this class of armour that we can show results that can challenge any obtained in the world. The following are recent examples.

On 1st September, 1899, a steel plate, manufactured by Messrs. Vickers for the Japanese armour-clad "Shikishima," building at the Thames Iron Works, was tested at Whale Island. The plate was 8 feet by 8 feet by 8¾ inches. It was termed a special nickel Harveyized plate, probably differing only in detail from the admirable Krupp process plates

made by Vickers for our own Government. The attack consisted of three rounds with 9·2-inch armour-piercing steel Holtzer projectiles. Two rounds were delivered with a velocity of 1,700 foot-seconds, and the third with 1,800 foot-seconds velocity. Each projectile weighed about 380 lbs. By Tresidder's formula, the penetration through wrought-iron is

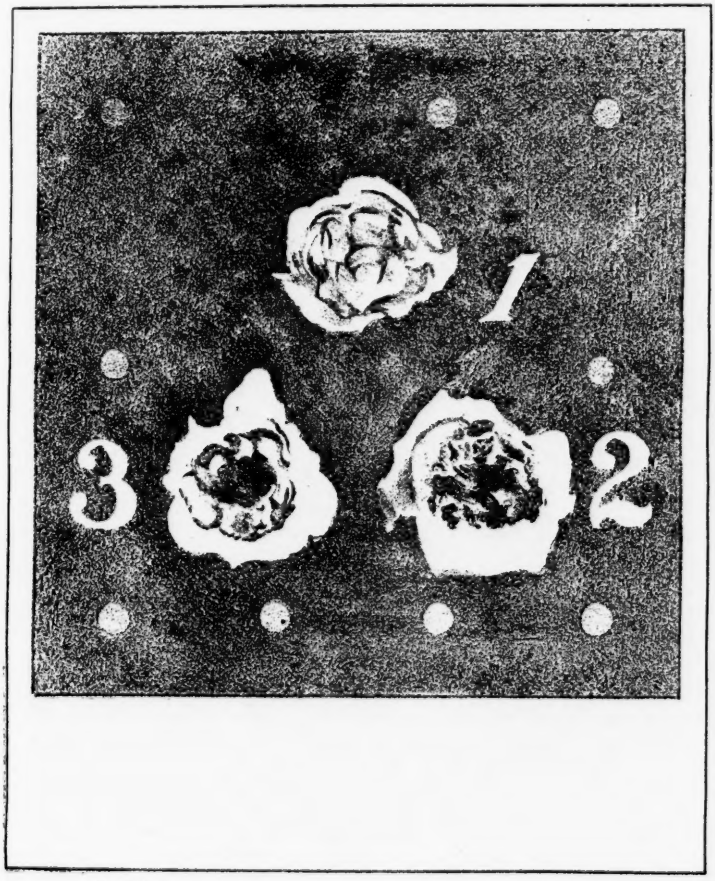


FIG. 1. ARMOUR PLATES FOR JAPAN.

17·1 inches for the first two rounds, and 18·6 inches for the third, the tests implying a figure of merit of 1·95 and 2·13 respectively. As the projectiles, far from perforating, only penetrated to a depth of 3 inches and $3\frac{3}{4}$ inches, the plate had a much higher figure of merit, but it is impossible to say what it was. The photo-process prints herewith, Figs. 1 and 2, show the front and back of the plates after the third round. The shots

had evidently been thoroughly broken up. In the large official photograph a trace of white radiating lines is visible, and these always imply extreme disintegration, being the mark of langrage skimming over the plate face. There are no cracks.

On 10th November, 1899, a firing trial of one of John Brown and Co.'s armour plates was made at the proving grounds of Armstrong,

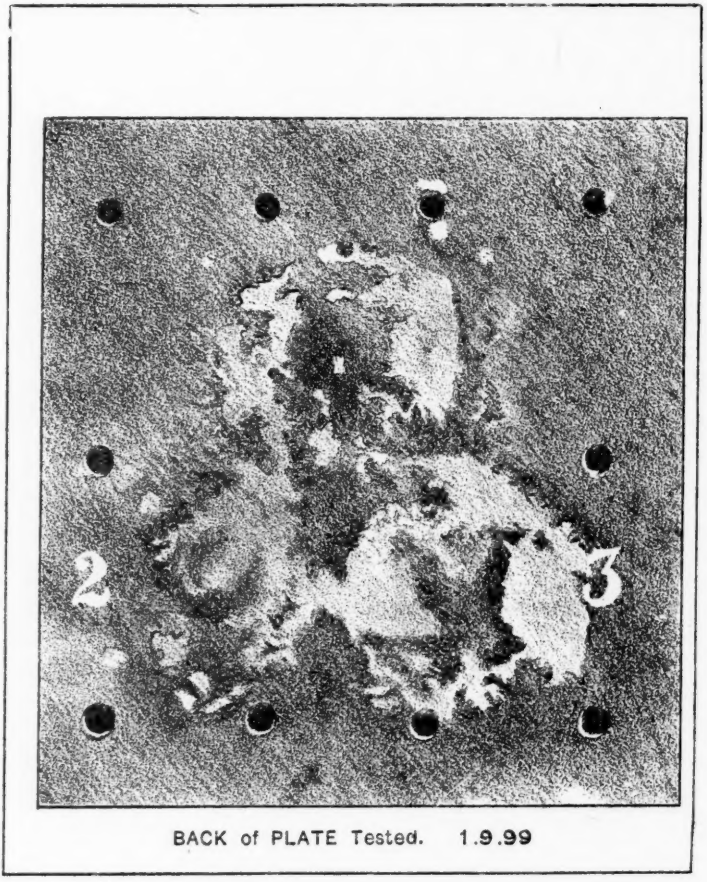


FIG. 2. ARMOUR PLATES FOR JAPAN.

Whitworth and Co., Limited, selected by Captain Mörch from a lot manufactured for the armour of two Norwegian battle-ships building in Elswick shipyard. The sample was subsequently reduced to dimensions for the prescribed test, of which the conditions were as follows:—Plate 8 feet by 6 feet by 5·9 inches; backing, 24 inches oak and 1¼-inch skin plate; bolts, eight of 2 inches diameter; number of rounds, four;

projectiles, steel armour-piercing 6 inches diameter and 100 lbs. weight; striking velocity, 1,960 feet per second; striking energy, 2,664 foot-

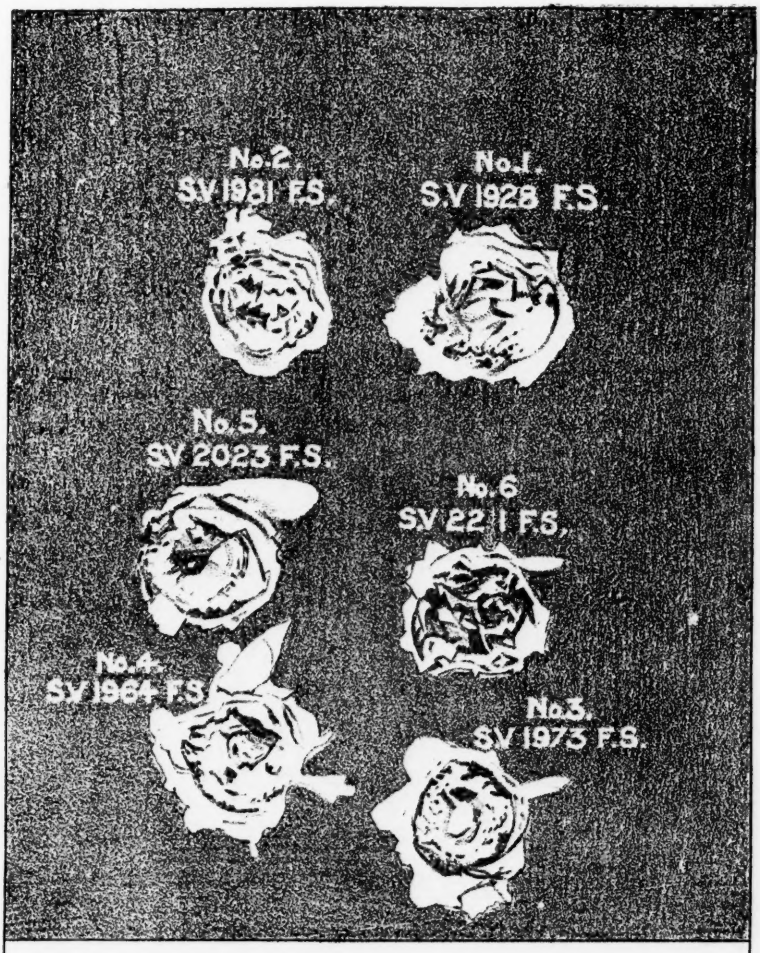


FIG. 3. 6-IN. ARMOUR PLATE FOR THE NORWEGIAN NAVY.

tons; calculated perforation, 13·4 inches of iron. The plate was expected to resist this attack without being perforated or seriously cracked (see Figs. 3 and 4).

The projectiles provided by the Norwegian authorities were made at the Elswick Works on the Wheeler-Stirling process, and, as they weighed

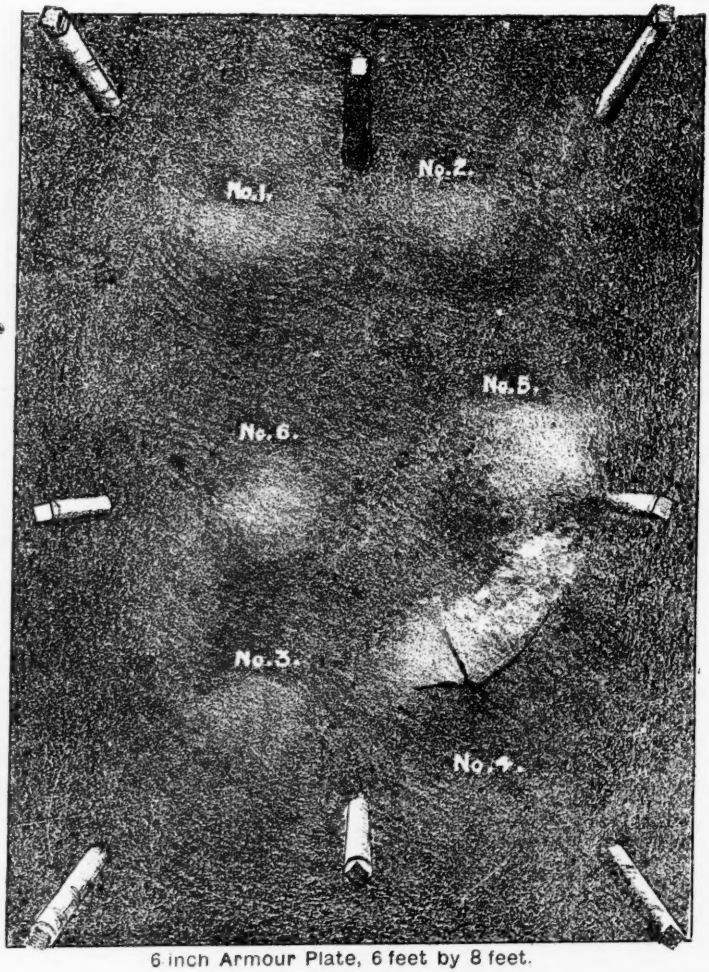


FIG. 1. 6-IN. ARMOUR PLATE FOR THE NORWEGIAN NAVY.

102½ lbs. each, the specified velocity was reduced to 1,936 foot-seconds, to compensate for the extra weight. The striking energy thus remained

unaltered at 2,664 foot-tons, and the calculated perforation remained 13·4 inches of iron.

The four prescribed rounds having been easily defeated, and no cracks being developed in the plate, the trial was pronounced highly satisfactory, and the whole of the armour represented was approved. To obtain some idea, however, of the ultimate defensive power of the armour, the attack was supplemented by two extra rounds at increased velocities, which also failed either to perforate or to produce any cracks in the plate except a few superficial air lines on the face. The following are the particulars of the results of each round:—

Number of round.	Projectile.		Striking velocity.	Striking energy.	Penetration.	Height of bulge at back.
	Calibre.	Weight.				
	inch.	lbs.	Ft.-secs.	Ft.-tons.	inch.	inch.
1	6	102¼	1902	2571·4	3⅝ (measured)	1⅛
2	6	102¼	1958	2725·1	3⅜ (estimated)	1⅜
3	6	102¼	1948	2697·3	3½ ,,	1¼
4	6	102¼	1940	2675·1	4⅛ ,,	1⅜[1]
5	6	102¼	1997	2834·6	4⅛ ,,	1½
6	6	102¼	2182	3392·5	5 ,,	2⅜

All projectiles were smashed to pieces. Except in the case of the first round, exact measurement of penetration was prevented by fragments of shot lodged in the indent. The last round was capable of piercing 17 inches of wrought-iron by Tresidder's formula; that is, 2·7 times the thickness of the plate fired at.

There is one interesting feature in this trial to be noticed, namely, that the bulge made at the back by No. 4 round has in its centre a star-shaped tear, showing that the shot is in a measure boring a hole which would be completed by sector-shaped pieces being torn and displaced outwards from the shot point. In the other five rounds apparently boring has been wholly defeated, and the shot point so far flattened as to be compelled to punch out a disc to get through the plate, entailing as already pointed out much more energy. It may be seen that No. 4 round happened to have less energy than all except No. 1; and it may be concluded that its perforation would be completed with less work than any of the other rounds. It is, in fact, an example of the case above referred to, where the blow is so truly normal to the plate surface and the projectile so good that the point, instead of being broken, retains much of its sharpness. Probably a capped shot would behave very nearly like this No. 4 projectile. If plates were really struck nearly normally on service, as may be seen here, caps should certainly be adopted.

A rough idea of the relative powers of armour of different kinds is important. I have always believed that the best plan of achieving this is to take wrought-iron as the standard. Captain Tresidder has suggested

[1] Shot's point apparently not destroyed. The above constituted the acceptance test.

a "figure of merit" based on the equivalent of each plate in wrought-iron thus expressed. Ordinary steel was equal to one and a quarter, Harveyized steel to from two to two and a half, and Krupp process to from about two and a half to three times its thickness in wrought-iron. Some manufacturers urge that steel can be made more uniform and certain in its quality than wrought-iron; but who is to fix the steel selected? Wrought-iron seems much less arbitrary, and less liable to be misunderstood, and the scope of its variation is but small.

The following table shows figures of merit attained by various Krupp process plates—that is, the relation of the thickness of wrought-iron that would have been perforated, to the thickness of the actual Krupp process plate attacked.

Plate Makers.	Thickness in inches.	Figure of Merit of		Date of Trial.
		Blow defeated by Plate.	Plate Perforated.	
Brown	6	2·72	—	Nov. 1899
Carnegie	6	2·73	2·95	July 1899
Krupp	6	2·41	2·86 (just)	Dec. 1899
Krupp	6	2·42	2·85 (just)	,, ,,
Carnegie	8	—	2·57	June 1898
Bethlehem...	8	2·46	2·56	Oct. 1898
Krupp	8	—	2·41 (just)	—
Krupp	10	2·35	—	—
Krupp	11·8	2·33	—	June 1896[1]

To pass on to actual use. At the present time the armour that has, I think, assumed by far the greatest importance is 6-inch plating. This comes in the following way. Six-inch plate lends itself to face-hardening specially well; thinner plates are apt to be contorted or warped in the hardening process. On the other hand, plates are always more difficult to make as the thickness increases. Now it happens that 6-inch Harvey and Krupp process armour had been successfully made considerably before other thicknesses. It also happens that Sir William White has given our battle-ships 6-inch protection for their 6-inch Q.F. guns, while those of foreign Powers long had 3, 4, 5, and in only, I think, one single instance, 6-inch armour. Consequently, our designs at once lent themselves to the adoption of hard-faced armour, the opportunity was promptly used, and, consequently, for a considerable period, extending nearly to the present time, our Q.F. guns have been singularly well protected; for while it would be a great advantage to have 6-inch plates against an adversary's 5, 4, or 3-inch of the same kind, the difference is greatly increased when our 6-inch are face-treated and those of other Powers are untreated steel. The special importance consists in the fact that the armour is so related to the power of the usual Q.F. guns, that while we could perforate their sides and nearly all cases with armour-piercing shells, they could not perforate ours, even with shot. Most naval officers depend more on the fire of their heavy Q.F. batteries than

[1] An early "record" plate.

on their primary guns, and it is difficult to see how a fight between ships so unequally equipped could fail to end in our favour, except from the possible decisive effect of some very happy shot from a primary gun—but this would rarely happen. M. Claudinon, who holds a prominent position in the factories and ironworks of the Loire, recently tried to persuade the French Chamber of Deputies that in our British ships protection against shell attack had been disregarded, doubtless, he suggested, because we had found high explosives dangerous and disbelieved in them. He held that in consequence three French ships were equal to five British. I would ask anyone to look at such a ship as the "Charlemagne" class with her alternate patches 3 inches of ordinary steel armour and her unarmoured spaces and then say how she would bear the attack of 6-inch Q.F. armour-piercing shells, or even common shells, and finally to show what the "Charlemagne's" 5·5-inch guns propose to effect against our battle-ships. Further comment seems to me quite unnecessary. For some years, I suppose, many of us have watched this curious phase in the development of battle-ships and have purposely abstained from calling attention to it. Now, however, foreign contractors are quite alive to it, and the newest Russian and other battle-ships have 6-inch Krupp armour, and as a consequence we are driven to bring in a heavier secondary gun capable of attacking it, that is a 7·5-inch gun firing a 200-lb. projectile with a high velocity.

Certain armoured cruisers have been built nearly covered with 6-inch hard-faced plates, notably the Italian "Garibaldi" class, and this seems to indicate what must largely prevail in the future. To this class belonged the ill-fated "Colon" which came out of Santiago harbour under Cervera. Now the "Colon" certainly failed to effect anything; neverth less it can be shown, I think, that this was owing to the blunder of assuming that because she had been sent to sea with the extraordinary omission of her primary turret guns, she was not fit to take a leading part. Undoubtedly this debarred her from attempting "belt attack"; but in spite of this fundamental omission I doubt if many ships better suited to conduct the particular running fight that lay before her could be found. She was almost wholly covered with 6-inch plates of a quality equal to Harveyized armour. The only American ship that she ought to have to pass was the "Brooklyn," and the "Colon" might have riddled this vessel with her Q.F. gun-fire, while the "Brooklyn" could only penetrate her sides with armour-piercing projectiles from her six available primary guns. Moreover, as a matter of fact, the United States vessels are said to have fired common shells only, both during this engagement and throughout the war, and these could not have injured the "Colon" seriously. With this capital defence, the "Colon" combined a very fair power of attack. Further, the "Colon" had a nominal speed, which ought to have ensured her escape from the other American ships, and she actually did obtain a lead of four or five miles, and then suddenly failed. Thus, having thrown off all the projectiles that struck her, she ran inshore and sank. I do not want to get drawn into any discussion of other elements of the battle of Santiago, but I think we must all be struck by the obvious possibilities of the "Colon," possibilities

which escaped recognition by the Spanish and, to some extent, by the United States officers also; for it seems strange that even Admiral Sampson, who is not only an able man, but also a high authority on armour, should have issued directions so little distinguishing between the "Colon," which was proof against common shell attack, and her fellows, which were open to the most terribly rapid destruction by common shell fire.

In conclusion, I would suggest that 6-inch hard-faced armour has exhibited powers which seem to ensure its application in the immediate future. Further, it seems as if belt attack was likely to be rarely attempted, seeing that the belt, with Krupp's process armour, can be made to defy all attack. Probably, then, the primary guns will at times attack the secondary parts of an enemy with common and armour-piercing shell. In America there is an idea that we all may have pushed the new type, with its great length and small bore, too far, and that a gun of larger calibre and lower velocity may prove more profitable. Lieutenant Meigs, of Bethlehem, expects shortly to submit for trial an 18-inch gun firing a 2,000-lb. projectile with 2,000 foot-seconds velocity, which piece is to weigh little more than our 12-inch gun. This, of course, is a modified primary gun. The heavy quick-firing pieces cannot afford to give up any penetrating power, or they will not be able to reach the broadside batteries of an enemy, and would, in fact, be nearly useless. The fact is, that each gun and its projectile will have to be more and more carefully designed, with a view to the powers called for by the particular work it is intended to perform.

I will just say a word on the question of the projectile which we are compelled to use for the attack of armour. As a matter of fact, we have two projectiles entirely different in their character served out, an armour-piercing projectile and a common shell. The issue of two such totally different projectiles implies a certain measure of discrimination. I have been said to be advocating impossibilities in advocating discrimination in the attack of a ship, and I admit that you should have always something to fall back upon in case of any difficulty. It does not do for people to have a difficult task in action. There is, however, the rule for general attack of an unknown adversary, which is as simple as it can possibly be, namely, that you fire common shell near the base of the foremast of any ship, when you are in doubt, and bring a few Q.F. guns to bear on any deck structure near the funnel and foremast. You are then firing common shell where it will have an effect in most ships, and you are shutting up the directing intelligence inside the conning-tower. Those are very important matters, and when in doubt fall back upon that course. But if a ship draws up, anchors, and makes a deliberate attack, she presents an enormous mark. I remember being told that our batteries would never hit a ship; in the first place, she would never come near us, and if she did, we never should hit her. I remember saying "Do you know a ship is 100 yards long and 20 feet high? Conceive a target 100 yards long and 20 feet high—you could hit her anywhere you like." It appears, then, to me that with the two different projectiles we have discrimination is involved, and under favourable conditions it is perfectly feasible.

Major A. D. SETON (the Forfar and Kincardine Artillery Militia):—I should just like to ask the lecturer whether he can tell me what actually has been done in the matter of piercing armour with shell carrying explosive charges. We are told that we *should* be able to do this, that, and the other, but I should like to know what thickness of plate actually has been got through with a shell carrying an explosive charge—I do not care whether it is a high explosive or an ordinary explosive. That seems to me, looking at it from the point of view of the man behind the gun, to be the essential of the whole matter. All these experiments of firing solid shot against a plate in cold blood are excellent—in fact, I suppose it is the only way to test the quality of a plate—but that is not the thing that concerns the gunner who has to stand behind the plate. What he wants to know is: What plate is going to keep out what shell. If the lecturer could tell us that, I personally should be greatly obliged to him.

Lieut.-Colonel W. HEMANS (late R.A.):—It is considerably more than twenty years since I sat under the lecturer at the Artillery College, Woolwich, and certainly enormous developments have been made in armour plates since those days. I have not followed this development with such minute care as the lecturer has, but, of course, I am very much interested in it all the same. I have, however, followed the gun question with considerable diligence for more than twenty years, and this gun of Lieutenant Meigs, of Bethlehem, seems to be a most extraordinary weapon. An 18-inch gun is to be built firing a 2,000-lb. projectile with 2,000 foot-seconds velocity, which piece weighs little more than our 12-inch gun! That seems to me to be a most remarkable piece of ordnance, if anything like it is really going to be introduced. I believe the latest 12-inch wire gun, the Mark IX., as it is called, weighs 50 tons—perhaps the lecturer will correct me if I am wrong—and our 16·25 gun, which is now practically obsolete, I believe, weighed 110 tons, and fired its projectile of 1,800 lbs. at 2,000 foot-seconds muzzle velocity. How on earth Lieutenant Meigs is going to build an 18-inch gun to fire a 2,000-lb. projectile with the velocity he states, and keep the weight of the gun down to anything like 50 tons, I fail to understand, and I should be very glad if the lecturer could explain that extraordinary gun.

Mr. R. A. HADFIELD, M.Inst.C.E.:—I have only been able to glance at the paper, and think it is another proof of how much we are indebted to Captain Orde-Browne for the great care he has displayed in bringing before us important information of this kind. I have read with great interest his many articles in the *Engineer*. It is such men who keep us posted up with information of technical importance, and I am sure we are deeply indebted to him. In his lecture he refers to perforation of 6-inch plates. I am a projectile maker, and, of course, try to get as good results as possible out of our own shot and shell. I may mention that we have recently been able to perforate a 7-inch hard-faced plate of the Krupp type with one of our 6-inch shot. I should add that it was not a British trial. The velocity was about 2,280 feet, and the same shot capped went through that plate with about 100 feet less velocity. I think that was rather a remarkable result. I mention this as showing that the British makers are doing their best to keep in the front whether in armour plate or shot and shell.

Captain ORDE-BROWNE:—What was the quality of the plate?

Mr. HADFIELD.—It was a Krupp plate of the latest type.

Captain ORDE-BROWNE:—An actual Krupp plate?

Mr. HADFIELD:—Yes, gas-cemented Krupp plate, hard-faced, quenched. Nowadays we projectile makers are also having to face plates of the K.N.C. type, that is, Krupp type, but non-cemented. That kind of plate is of very high quality indeed. Although it is not hard-faced, that is, not quenched or cemented, it has very high resisting qualities. I see a Sheffield maker here, and without giving away secrets, he might, perhaps, be able to tell us what are the mechanical

properties of such a material. General facts of that kind would help us all to understand these problems better. For my own part I may say I think it would be very much better if more information on these matters was given to the public, as is done in America. Each year I read the American Naval Reports of Naval Progress, and certainly one obtains a good deal of information of a valuable character in that way. The authorities here, for reasons which they know best, do not give any information at all. Were it not for such men as Captain Orde-Browne we should therefore be really very much in the dark, and we are much indebted to him. We recently had a trial of another of our shot which it might be interesting to mention. I can vouch for this in every way. The shot was 4·7, weighing 44 lbs., capped. It was fired, I admit, against a fragment of a plate, and the plate itself had been previously attacked, but the part which our shot struck was in perfectly good condition. It was placed at an angle of 20°, and by means of the cap and a velocity of 2,300 foot-seconds our 4·7 shot got through that 6-inch Krupp, hard-faced, gas-cemented plate. It was really a remarkable result. I do not instance this merely as a proof of the quality of the projectile, but as showing that a cap when properly applied really greatly increases the efficiency of the shot. They say that in America all armour-piercing shot have caps, but on this side we do not appear to hear much about it. It is supposed to interfere with the range. I have talked to American friends, and they tell me they do not take that view at all. It may be we are right, but it would be well to have more information on the point. With reference to the queries of one speaker regarding armour-piercing shell, I could give information, but, of course, one has to consider certain rules laid down by the War Office and Admiralty, and very properly so. But I may say that it is possible to carry armour-piercing shell through steel plates even of the latest type. In America I know they are using large capacity projectiles, 10- and 12-inch calibre, which are going through soft steel plates about half a calibre in thickness, and these carry a bursting charge through. I am aware that that is not a very severe test, because the plates are not hard-faced, but the gentleman who spoke a few minutes ago may be interested in knowing that. They are about 5 or 6 per cent. capacity, that is, 5 lbs. of explosive material for a shell weighing 100 lbs. I again offer my best thanks to Captain Orde-Browne for his interesting paper.

Captain ORDE-BROWNE, in reply, said:—With regard to Major Seton's question, I believe it is laid down that a steel common shell can get very nearly what Mr. Hadfield said, or a little beyond that—from $\frac{1}{2}$ to $\frac{3}{4}$ calibre in ordinary steel, carrying an explosive through. Of course, it makes a difference what the plate is you are firing at. I have a table, but not with me; and speaking from memory, I should say that a half is a rough rule; a hard face makes very little difference to the common shell, as there are points to break, so that Harveyized armour might not resist much better than ordinary steel. Krupp armour resists more, being tougher; common cast-iron shell used to perforate about half a calibre of wrought-iron.

Major SETON:—Is there any instance of it actually happening that a shell with an explosive got through a hard 6-inch plate?

Captain ORDE-BROWNE:—I should think so.

Major SETON:—It has been done? They carried a bursting charge through a 6-inch hard plate?

Captain ORDE-BROWNE:—Yes; but you want a big shell to do it. You could not expect to do it with your secondary guns. It would take a primary gun.

Major SETON:—A 12-inch?

Captain ORDE-BROWNE:—Yes. With regard to Colonel Hemans' scepticism about this 18-inch gun, I share his scepticism in a degree; but I suppose some approach to the conditions laid down for this gun will be achieved.

The 110-ton gun mentioned differs from this in the fact that the former had brown cocoa powder. With smokeless powder you get more work out of the gun. The mischief is the erosion, which is terrible. The argument of Lieutenant Meigs is that high velocity is a very expensive thing, in the same way that high speed is a very expensive thing in a ship. Lieutenant Meigs thinks you could use a very big projectile with a lower velocity and not tear the gun to pieces so much. Possibly there may be something in the direction in which he is moving, but I share in Colonel's Hemans' disbelief that he will get the full results he mentioned.[1] With regard to what Mr. Hadfield has told us, I know that he has had remarkable success with certain armour-piercing projectiles, and what he has now told us about the 4·7-inch capped projectile getting through a 6-inch Krupp plate is an extraordinary result. I think we might go a long time before we could beat that. Observe, the angle was 20°. When you get much over 20° it is found that the cap does not do any good. Like Mr. Hadfield, I am in favour of caps, because I think it has yet to be shown that it does positive harm over 20°, to counterbalance the advantage it gives up to 20°. The Navy have laid it down that you must reckon about 30° on service, which, of course, is over 20°. Every now and then, however, you would strike at 20° and then get the benefit of the cap. It must be secure. I should like to have asked Mr. Hadfield what the projectiles were made of. He has some remarkable cast-steel projectiles. That projectile was forged, I presume?

Mr. HADFIELD:—No—cast.

Captain ORDE-BROWNE:—I suppose you would say there is some measure of uncertainty in the cast steel? It may produce as good results as the forged; but I suppose there is some uncertainty?

Mr. HADFIELD:—We think not.

Captain ORDE-BROWNE:—They are cheaper, are they not?

Mr. HADFIELD:—Yes.

Captain ORDE-BROWNE:—Then you ought to be a most successful man!

The CHAIRMAN (Admiral Sir John Hay):—I am sure, gentlemen, you will desire that we should express our grateful thanks to the lecturer for the lecture he has given us, and the interesting discussion which has followed. I am merely a casual Chairman, and I had not read the paper before I came to the meeting, and therefore I shall not venture to intrude any opinions of my own, even though I had the right to form any. I have come to learn. I formed a good many opinions some years ago, but things have altered so fast since those days that I should only be detaining you unnecessarily. I must express my own thanks and the thanks of this meeting to the lecturer.

[1] Since the discussion, information has come from America that the gun is to weigh 59 tons, which is considerably more than 50 tons, the weight of the 12-inch Mark IX., and that the muzzle velocity as yet is 1,800 foot-seconds, not 2,000.—C. O.-B.

THE GERMAN IMPERIAL MANŒUVRES IN POMERANIA IN 1900.

A Précis from the "Militär-Wochenblatt," "Internationale Revue Dresden," "Revue Militaire Suisse," and other periodicals.

By Lieut.-Colonel E. GUNTER, p.s.c., late East Lancashire Regt.

Note by Translator:—

THOUGH on a limited scale, in a restricted area, the German Manœuvres of last year were of especial interest. For the first time since the abolition of the Corps Artillery in Germany were the batteries on each side attached to the Divisions of Infantry and Cavalry only, and Field Howitzers used. Machine guns and cyclist companies were employed. The operations leading to the passage of the River Oder and the details of the crossing are of especial interest to British officers, and, though there is much which lends itself to criticism, yet the thorough way in which the Manœuvres were carried out must commend itself to all.

The *Revue* says:—

"As far as is possible under peace conditions the movements of each Army were concealed from the opposing force until contact was actually established, and unrealities were avoided. Both sides pushed forward a great screen of Cavalry, behind which each had free scope to manœuvre and to exercise independent action. There were many engagements in which the tactical skill of each arm was tested."

It apparently had been intended to combine Naval operations with the Military Manœuvres, but these were not proceeded with.

In the General Idea, however, and in the "Special Ideas" given out during the operations, the co-operation of the Fleets was assumed.

Graf von Schlieffen, Chief of the Great General Staff, directed the Manœuvres.

General Idea (*see General Map*).

A foreign Army (Red) composed of 4 strong Infantry Divisions and a Cavalry Division has landed near Rügenwaldemünde with the object of marching on Berlin,[1] while the Home Army (Blue) is employed elsewhere (out of the theatre of war).

An Army Corps (Blue) of 3 Infantry Divisions and a Cavalry Division (all belonging to the Guard Corps) is accordingly hastily assembled at Berlin to repulse the invaders.

On the 2nd September the following was the situation:—

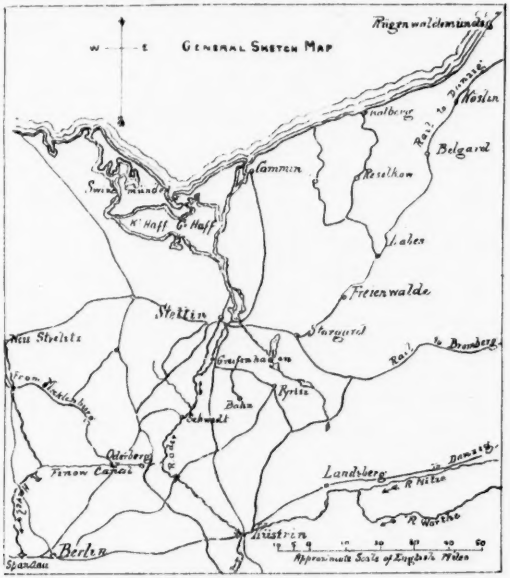
Red.—Cavalry Division about Pyritz-Bahn.
42nd Infantry Division between Stargard and Freienwalde.
3rd, 4th, 41st Infantry Divisions on the line Reselkow-Labes.

[1] Rügenwünde to Berlin about 220 English miles; to Stettin about 130.

The Base Rügenwaldemünde is occupied, and fresh transports with troops are expected.

The RED fleet had, after covering the landing of the RED Army, steamed rapidly against the BLUE fleet, hastening from Kiel to prevent this, and had encountered and defeated it. It is now about to move against Swinemünde.

The RED Army, anticipating the capture by its fleet of Swinemünde,[1] as above, and the consequent transfer of its base of operations to that



place, moves forward three of its Divisions towards Stettin,[2] in order to advance thence on Berlin by the left bank of the Oder. Its Cavalry Division is to carry out the screening and reconnoitring duties on the right bank of the Oder. Attached to it is the 42nd Infantry Division, which is to follow to Pyritz. It is intended to cross the Oder between Küstrin and Oderberg.

BLUE.—The first object of the BLUE Army at Berlin was to prevent the passage of the Oder, which it could foresee would be attempted.

DESCRIPTION OF THE COUNTRY.

The actual manœuvring took place almost exclusively on the right or east bank of the Oder, but it must be mentioned that a network of roads spreads out in fan-like form from Berlin to the Oder, which much facilitated the march of BLUE on a broad strategic front to seize the passages of that river.

[1] Cape Ancona is about 70 miles N.W. of Swinemünde; Kiel about 140 miles W. of Ancona.

[2] Stettin to Berlin about 90 English miles.

Moreover, the whole force of BLUE was concentrated at Berlin, whereas, at the outset, RED had only one Infantry Division, and its Cavalry Division pushed forward towards the Oder, and that one Infantry Division not further than Pyritz. This gave BLUE the initiative, and made it probable that it would take the offensive, while RED would for the time, at least, though an invading force, be confined to playing a defensive part.

The approach from the west to the Oder, from Küstrin to Nieder Wutzow, was easy by reason of the aforesaid excellent roads. Moreover, the many farmsteads, orchards, etc., concealed but did not impede movement, whereas the large woods extending from Küstrin for nearly 25 miles down stream on the right bank much hindered the movements of cavalry and artillery, and obstructed the view till right on the water's edge.

But the actual crossing was no easy matter. In the whole river length, from Küstrin to Stettin, 78 miles, there were, besides of course, several bridges in the fortress of Küstrin and the town of Stettin and the permanent railway bridge at Zäckerick, at Schwedt a bridge of boats, and at Greifenhagen a wooden bridge only (*see Sketch-Map No. 1*).

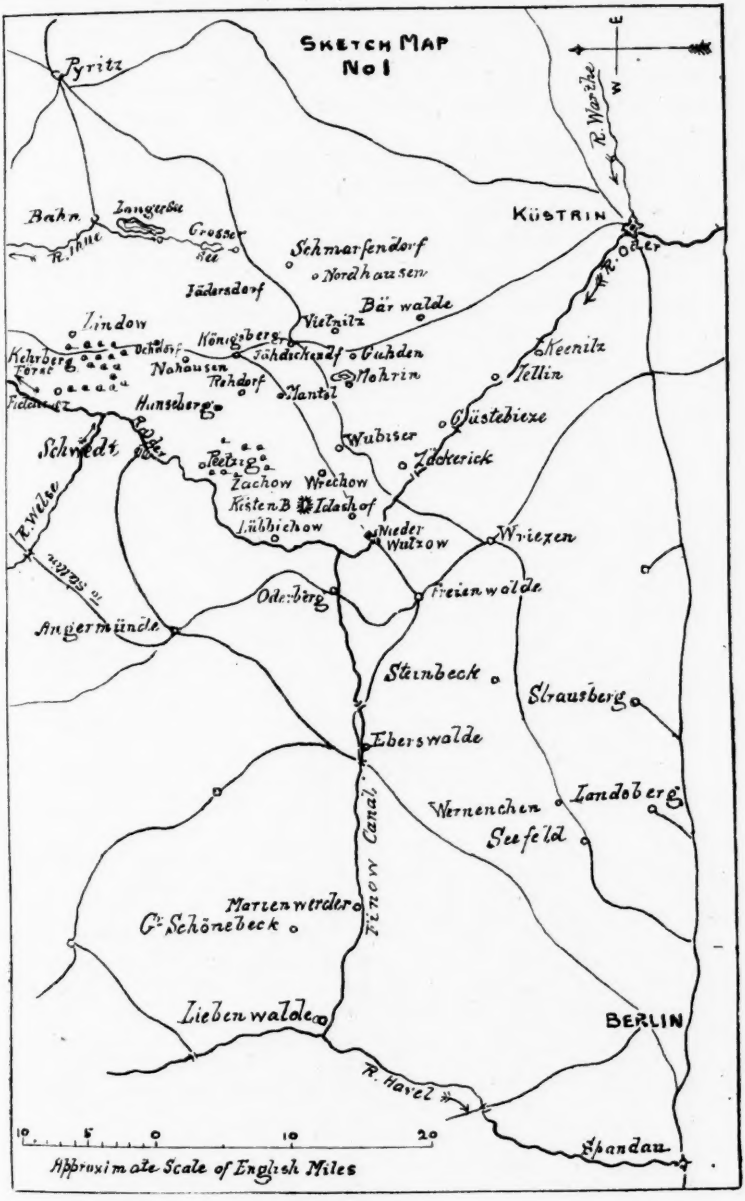
There were, however, ferries at Kienitz (b b), Zellin (r b), Güstebieze (r b), and Nieder Wutzow (r b), which evidently indicated good places for throwing bridges, but the banks were marshy, and the right bank commanded the left.

At the bend of the Oder, near Oderberg, the chain of low hills called the "Märkische Schweitz" on the left bank, and the high plateau of Neumark on the left, approach the river and spurs run down from these ranges to within a short distance of the river. From this point the crossing is much more difficult, and the high right (eastern) banks can easily be watched by a few cavalry. The upper part of the river valley as far as Oderberg is from a mile to nearly two miles wide. Below Oderberg, Greifenhagen and Schwedt are the only practicable points of passage. The river is navigable the whole of the length in question. At Garz the Oder divides into two great branches, which re-unite below Stettin. The eastern branch is called the Reglitz. The Finow Canal joins the Oder (passing by Oderberg due west) and the River Havel, which flows from Mecklenburg nearly N. and S. by the Fortress of Spandau. It is navigable.

On the route from Stettin to Berlin by the left bank of the Oder the obstacles to be overcome are the broad marshy valley of the Welse and the Finow Canal. The Welse can only be crossed by large bodies by the roads, so this portion of the country can be watched by a few cavalry only.

Between the Stettin-Berlin railway only one great road need be noticed, viz., that leading by Garz Vierraden to Schwedt Angermünde, which crosses Finow Canal by Eberswalde to Berlin.

On the right bank of the Oder the Neumark is an agricultural country, with large farmsteads, woods, many lakes, and rich meadows. North-west of Küstrin the Neumünster Först extends nearly to Fürsten-


SKETCH MAP
No I
N
E
W
Pyritz
R. Warthe
Bahn
Zangerbie
Grosse
See
R. Ihne
KÜSTRIN
R. Oder
Schmarsendorf
Nordhausen
Jädersdorf
Bär walde
Lindow
Vietzritz
Königsberg
Kehrberg
Forst
Schloss
Nahausen
Töhdichendf
Cuhden
Mohrin
Keenitz
Tellin
Rehdorf
Mantel
Fidelitz
Hunsberg
Güstebiexe
Schwedt
Wubiser
Zäckerick
Zeetzig
Zachow
Wrechow
R. Welse
Kosten B
Idashof
Lübbichow
Nieder Wutzow
Wriezen
to Stettin
Oderberg
Freienwolde
Angermünde
Steinbeck
Strausberg
Eberswalde
Wernenchen
Landsberg
Seefeld
Finow Canal
Marienwerder
Gr. Schönebeck
Lieben walde
BERLIN
R. Havel
Spandau
10 5 0 10 20
Approximate Scale of English Miles

felde (5 miles S.E. Bärwalde). West of Bärwalde a great heath extends to Zäckerick. West of Königsberg lies the Forest of Peetzig, and south of Fiddichow that of Kehrberg. The comparatively high elevation (460 feet) of the wooded hills north of this region is peculiar, and the ground between the Oder and the Madü See is much broken by lakes, ravines, etc.

The tributaries of the Oder flow S.E. to N.W. from the watershed between the Warthe and the Oder with regularity. They flow for the most part through marshy meadows making movements for attack and counter-attack difficult. This afforded good practice to the leaders in the choice of positions and to the troops by the broken and varied character of the ground.

The chief of these tributaries, the Thue, rises in the Langer See and flows in a continuous chain of lakes and morasses by Wildenbruch and Bahn, turns abruptly west by Klein Schönfeld, and falls into the Reglitz above Greifenhagen. It is marshy, unfordable even by Infantry and only passable by bridges.

There was very little ground suitable for the action of large Cavalry masses.

BLUE decided to march to the Oder on a broad front (yet sufficiently concentrated). To cross at Küstrin and Schwedt would have led to too wide a dispersion. To avoid crossing with the whole Army Corps by the Zäckerick railway bridge, military bridges would have to be thrown. For this the ferries Nieder Wutzow and Güstebieze seemed suitable. The Corps Bridge Train could be brought from Spandau by the Havel and Finow Canal, and the Fortress Bridge Train from Küstrin utilised. The Guard Cavalry Division was to precede the march of the Guard Corps and to reach the Oder in two marches. The Infantry in three.[1]

On the 2nd September single squadrons and officers' patrols were pushed forward, and some reached the Oder the same day.

On the 3rd the Infantry marched in three columns. The left moved by Gross Schönebeck, Liebenwalde, Eberswalde; the right towards Küstrin.

RED.—*On the 2nd September*, the Red Cavalry had reached Bahn and pushed forward cavalry patrols towards the Oder.[2] One Regiment (the Zieten Hussars with some cyclists crossed the river and reached the Welse. The advanced Cavalry of both Armies were thus in contact.

3rd September.—The Main Body of RED'S Cavalry Division moved to the Oder and seized the passages from Nieder Wutzow to Zellin. The Rifle Battalion of its 3rd Division followed late that evening in support to Zäckerick and Alt Rüdnitz with some machine guns.

BLUE.—The Guard Cavalry Division, reached with the 2nd Brigade Strausberg, the 3rd Brigade Steinbeck, the 1st Brigade in support at Stein-

[1] Berlin to the Oder E. of Kienitz about 55 English Miles.
" " Zäckerick " 44 " "
" " Nieder Wutzow " 45 " "

[2] Bahn " the Oder " 30 " "
The Welse to Oderberg " 22 " "

Kornenchen with the Horse Artillery. On the left a Cuirassier Regiment of divisional Cavalry with a Cyclist Company moved to Marien Werder and Eberswalde, drove back the patrols of the (RED) Zieten Hussars and followed them that evening to Angermünde and sent patrols forward to Schwedt.

The Guard Corps Infantry reached the following points :—

Left (3rd Division) Bernan-Wandlitz, Centre (1st Division) Seefeld, Right (2nd Division) Alt Landsberg. Their Cavalry screen concealed their movements, so that the RED patrols could not quite detect those of the right and centre columns, but the Zieten Hussars could not fail to discover those of the advanced troops on the left by Eberswalde, behind which Infantry were noticed. This indicated the movement of several columns on Angermünde down the left bank of the Oder. The RED Cavalry Division would not by crossing the Oder expose itself to be overwhelmed by superior forces. It, therefore, confined itself to watching the points of passage in readiness to oppose any actual crossing.

The Guard Cavalry Division (BLUE) saw that at Nieder-Wutzow, Zäckerick, and Güstebieze, owing to the enemy holding the commanding bank, it was difficult to force the passage. Its commander therefore decided on the night of *3rd September* to make a flank movement above these points through the Neumühler Först. Thus the farmsteads, buildings, etc., there would facilitate, as they would conceal his movements. He decided to cross about Kienitz and asked the commander in Küstrin to lend him his Bridge train for the construction of a bridge, and to push forward a battalion of the garrison down the opposite bank to guard the construction of the bridge.

The Guard Cavalry Division BLUE concentrated about noon at Wriezen, and as soon as it was dusk[1] moved toward Kienitz. At the same time the Battalion started from Küstrin[2] along the right bank, and the Bridge train with two companies of Engineers rowed quietly down stream. All reached their destination about midnight. The Battalion on the right bank drove a squadron of RED Cavalry out of Kienitz ; the bridge was commenced at once and thrown across by 4.30 a.m. on the 4th. The RED Squadron at once reported the affair to the Headquarters of its Cavalry Division. But an intercepted dispatch stated that the BLUE Cavalry Division was to cross at Nieder-Wutzow on the night of the 4th. This might, of course, have been a "ruse" of the enemy, but the possibility of a crossing here could not be overlooked. One Brigade of RED'S Cavalry Division was therefore sent there, the two others were concentrated south of Bärwalde[3] in order to be able to oppose a crossing at either point. Thus weakened, however, there were only 13 squadrons[4] to oppose to BLUE'S Cavalry Division, which had meanwhile crossed and debouched from the Neumühler Först unhindered. With its united

[1] The weather was hot and dry. Sunset was about 5·30 p.m.

[2] Küstrin to Kienitz, 12 miles ; Wriezein to Kienitz, 14 miles.

[3] Bärwalde to Wutzow about 16 English miles. Bärwalde to Viehnitz 6 English miles.

[4] Out of 25.

strength (6 Cavalry Regiments) it attacked RED's Cavalry in the early morning, and drove it through Bärwalde to the north of Viehnitz. BLUE was too exhausted to pursue further. This action freed all the passages from Küstrin to Nieder-Wutzow, which was occupied by the Advanced Guard of the 3rd Guard Division. Before abandoning the river, however, the RED Cavalry blew up the Railway Bridge at Zäckerick, which it would have taken some days to restore.

On the evening of 5th September RED'S Cavalry had retired to the line Kleinzow-Mohrin-Viehnitz-Nordhausen, the Rifle Battalion in support, having withdrawn from Alt Rüdnitz to Mantel. Farther west Zieten Hussars were at Lübbichow, having re-crossed the Oder at Lunow (about 10 miles below N. Wutzow), leaving a squadron to watch the latter ferry. The 42nd Division was at Bahn. During the day the advanced parties of the 1st Guard Division (BLUE) had reached the Oder and had passed over two battalions by ferries and in boats to the right bank, the main body N.E. of Wriezen. The main body of the 3rd Division at Freienwalde. On 6th September the BLUE Division rested after their exertions, but that night bridges were constructed at Güstebieze and Nieder-Wutzow; on that day the 12th Division (RED) arrived at Hanseberg from Bahn. 7th September (BLUE) crossed the Oder as under:—

2nd Division at Güstebeize.
3rd ,, ,, N. Wuntzow.
1st ,, ,, Part at each bridge.

RED'S object was to oppose the advance of BLUE, or failing this to draw its forces in pursuit parallel to the Oder, while it retired upon its supporting Infantry Division, without which it could no longer successfully oppose BLUE'S advance. This Infantry Division (42nd) had late on the 6th reached Hanseberg; early on the 7th it moved through the Peetzig Först so as to attack in flank the hostile troops reported to be marching from Nieder-Wutzow to Königsberg, for which purpose it took up a position of readiness near Zachow, Artillery on the Kistenberg.

BLUE.—The A Guard of the 3rd Guard Division had been pushed to Idashof to cover the passages at Nieder-Wutzow.[1] It was attacked by the RED 42nd Division and driven back with loss to Karlstein.

Intended movements in support:—

3rd Guard Division by Zehden on Königsberg.
Half 1st ,, ,, ,, Nieder-Wutzow on Gross Wubiser.
,, 1st ,, ,, ,, Güstebieze Wutzow on Gross Wutzow.
2nd ,, ,, ,, ,, ,, on Mohrin.
Guard Cavalry Division towards Königsberg to threaten RED'S retreat.

The 1st Brigade of the Guard Division did not receive its orders, but marched to the sound of the firing by Kleinzow or Wrechow, threatening the left flank of the 42nd Division.

[1] 2 miles behind.

This was now fighting at Zehden with BLUE's leading battalions, but seeing the above threatening movement, it skilfully withdrew in a northernly direction towards the Peetzig Fröst, covered by its artillery and rifle battalion, and bivouacked at Hanseberg. It had fulfilled its mission.

The 1st Guard Division bivouacked at Wrechow.
3rd ,, ,, ,, N. of Zachow.
2nd ,, ,, ,. S. of Wubiser.

The Guard Cavalry Division had difficult ground to pass over. It was attacked by RED Cavalry Division just after it had passed over some marshy ground, and was crossing the railway running from Wriezen to Jädickendorf. Taken at a disadvantage, it fell back to Guhden. The RED Cavalry did not pursue, because news of the retreat of its Infantry to Hanseberg was brought to it. It retired, therefore, to Königsberg, holding the passages of the marshy Röhricke stream there. The BLUE Cavalry Division then followed it slowly to Jädickendorf.

The Headquarters and three other Infantry Divisions of RED were now between Stargard and Stettin.

8th September.—BLUE's dispositions: Guard Cavalry to make a wide flanking movement by Schönfliess.

R. 2nd Guard Division by Jädickendorf on Königsberg.
C. 1st ,, ,, ,, Mantel ,, ,,
L. 3rd ,, ,, ,, Rehdorf ,, ,,

Touch had been lost of the enemy.

On reaching Königsberg and getting in no reports of the enemy, the BLUE commander ordered :—

1st Division to Uchdorf.
2nd ,, ,, Jädersdorf-Thänsdorf.
3rd ,, ,, Nahausen.

On the way to Uchdorf the enemy was reported in position S.W. of that place. The 1st Division deployed for attack ; the bulk of two other Divisions were employed in carrying out enveloping movements against both flanks. Before these could be quite developed, however, the RED Division (42nd) withdrew through the Kehberger Först, after holding its ground some time with its well-handled artillery, to Lindow.

BLUE followed up and bivouacked in the Kehrberger Först, its outposts along its northern edge.

The BLUE Cavalry Division had moved rapidly from Schönfliess to Neuendorf (3 miles S.E. of Bahn) to attack the RED Cavalry Division, which was covering the left flank of its retreating Infantry. It attacked RED near the Langer See, and drove them back, but they skilfully held the defiles, and in the evening were still about Bahn, their outposts being halfway between that place and Liebenhof. BLUE's Cavalry Division cantoned N. and E. of Bahn, about Neuendorf.

Here the first phase of the manœuvres ended, and the 9th September was a day of rest for the troops in cantonments.

These preliminary movements and actions from the 3rd to the 8th September were of especial value as affording practice to the Cavalry in the exercise of their strategic duties, in the passage of a wide river, and

a series of fights in broken ground, which, though not rising to the dignity of a battle, were of great use in training all the troops in minor tactical operations of great value in war. The admirable way in which the 41st Infantry Division held its ground and broke off the fight just at the right moment is particularly noticeable, as well as the handling of the Artillery in these rear-guard actions.

In the second phase of the manœuvres the Oder which was only passable by the permanent bridges of Greifenhagen and Stettin bounded the operations on the west and the Madü See on the east (see Sketch-Map 2). The general character of the country has already been briefly indicated. The roads were numerous and sufficiently good everywhere.

BLUE had the advantage over RED in that the whole of its Divisions were concentrated, whereas the latter had only one Infantry Division pushed forward, the other three being a day's march in rear. The screen formed by its Cavalry Division and advanced Infantry Division, however, hid from BLUE the intentions of the two other Divisions. They might from their position have projected either a movement on Stettin or on Stargard.

BLUE.—Orders for 10th September. Object to push RED back on Stettin and cut him off from his base.

The Guard Cavalry Division from Bahn by Kunow on Wartenberg.

R. 2nd Infantry Division from Wildenbruch by Bahn on Kunow, starting 8 a.m.

L. 3rd Infantry Division from Jägersfelde Selchow and Gr. Schönfeld to Heinrichsdorf.

C. 1st Infantry Division and Headquarters Selchow by Marienthal on Liebenow.

When the Advanced Guard of the Left Column reached Heinrichsdorf hostile troops of all arms were reported at Klein Zarnow-Wilhelmshöhe. RED's object was to move S.W. on a broad front covering its communications. Its three Divisions had by rapid marching been concentrated at Stettin under cover of demonstrations by the Cavalry and 42nd Infantry Division.

The BLUE 3rd Guard Division at once deployed for attack on feeling the enemy; the Advanced Guard of the 1st Division was directed to envelope the enemy's left flank from Liebenow, and the 2nd Division was advanced from Bahn to Gebersdorf.

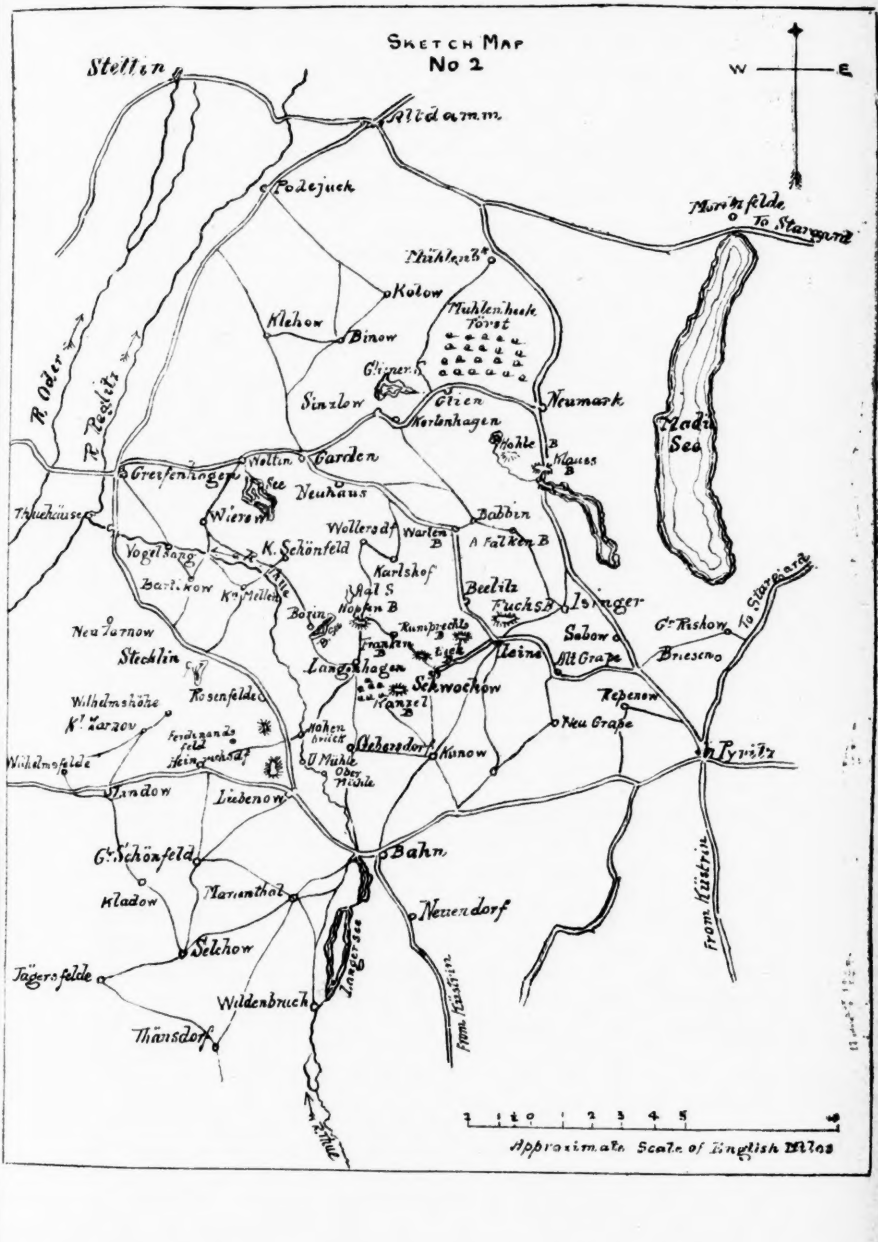
The 42nd Infantry Division RED, which was in an exposed situation, hereon withdrew across the Thue by Vogelsang to Wierow.

RED had given the following orders for the 10th September:—

The Cavalry Division from Langenhagen and the 42nd Infantry Division to hold the enemy and in case of necessity retire along the Oder.

3rd Infantry Division to march at 5 a.m. by Altdamm-Mühlenbeck-Glien to Neumark, and occupy the passages of the Kreck Graben and Klausdamm.

The 41st Infantry Division to march at 5.30 from Podejuch by Klebow to Woltin and Garden.


SKETCH MAP
No 2
W
E
Stettin
Altdamm
Podejuch
To Stargard
Kolow
Klebow
Binow
Sinzlow
Glien
Neumark
Kortenhagen
Madü See
R. Oder
R. Reglitz
Greifenhagen
Woltin
Garden
See
Neuhaus
Wierow
Babbin
Wollersdf
Warlen
K. Schönfeld
Vogelsang
Karlshof
Beelitz
Isinger
Sabow
Briesen
To Stargard
Neu Tarnow
Stecklin
Rosenfelde
Langenhagen
Schwochow
Leine
Alt Grape
Repenow
Neu Grape
Pyritz
Kunow
Lindow
Liebenow
Bahn
Gr. Schönfeld
Kladow
Marienthal
Neuendorf
Selchow
Jägersfelde
Wildenbruch
Thänsdorf
Langer See
From Küstrin
From Küstrin
Approximate Scale of English Miles

The 4th Infantry Division, with Army Headquarters, to march at 4.45 by Höckendorf-Binow to Sinzlow and Kortenhagen.

A mixed detachment (1 squadron, 3 battalions, 2 batteries Field Artillery) to march at 7 a.m. from Hohenzaden by Greifenhagen to Weirow.

The left bank of the Oder to be reconnoitred as far as the River Welse; the right bank as far as the line Buddenbrock-Borin-Leine-Gr. Rischow.[1]

BLUE.—After the retreat of RED from Klein-Zornow, the Infantry Divisions continued their march N.E., and by the afternoon had reached the line Gross-Zarnow-Schwochow-Langenhagen-Rosenfelde.

The Guard Cavalry Division, after concentrating E. of Bahn, received fresh orders to cover the right of their Army and outflank that of the enemy more effectually by moving round by Rohrsdorf and Alt-Grape to Leine.

Its batteries took position on the Fuchsberg, whence they shelled at long range the RED Cavalry Divison near Karlshof. RED columns were reported on the march to Isinger, the BLUE Cavalry retired to Neu-Grape.

The RED Cavalry Division followed as far as Sabow.

That evening the outposts of the contending forces were only about a mile or so apart in places. The main bodies of both armies occupied close cantonments as under :—

RED.—Cavalry Division Sabow-Isinger.
3rd ,, Falkenberg-Wartenberg.
4th ,, Garden-Sinzlow.
41st ,, Weirow-Woltin.
42nd ,, Greifenhagen.

BLUE.—Guard Cavalry Division Pyritz.
2nd ,, Infantry ,, Gr. Zarnow-Kunow.
1st ,, ,, ,, Gebersdorf-Liebenow.
3rd ,, ,, ,, Rosenfelde-Heinrichsdorf.

11th September.—The two forces being in such close contact fighting was inevitable. As a fact, both sides determined to take the offensive on this day. BLUE intended to attack the left and centre of RED while its Guard Cavalry Division covered its right flank as before.

RED which was now under the command of the German Emperor in person, determined on a wide sweeping enveloping movement on both flanks for which the orders were briefly as follows, the movements being covered by the outposts :—

The Cavalry Division is to continue to guard the left flank about Isinger.
,, 3rd Division by Falkenberg-Isinger to Leine.
,, 4th ,, ,, Wartenberg ,, Beelitz.
,, 41st ,, ,, Woltersdorf-Karlshof to Frankenberg.
,, 42nd ,, ,, Klein Schönfeld to take position on the Hopfenberg.

[1] A front of about 10 to 12 English miles.

BLUE.—The 2nd Guard Division moved by Schwochow on Wartenberg, detaching a mixed force of 1 Squadron, 4 Battalions, 3 Batteries Field Artillery towards Alt-Grape-Isinger, the remainder (8 Battalions, etc.) advanced to the Rumprechts Berg, but on approaching Leine it was found occupied by the enemy. The Guard Cavalry had taken position on the low heights W. of Neu-Grape.

Leine was only held, however, by one RED Battalion, which with great temerity counter-attacked. The result was that it was overwhelmed, and had to give up the village and withdraw in haste to Isinger and Alt Falkenberg. Meanwhile the 1st Guard Division had advanced: Its 1st Brigade to Karlshof and the 2nd to Wartenberg.[1] The 1st Brigade had to give way before the sharp counter-attack of the RED 41st Infantry Division, and RED'S 4th Infantry Division also managed to envelope the right flank of the 2nd Brigade of the Guards. Covered by their artillery on the Hopfen Berg, the Guards made good their retreat by Frankenberg and the Eich Berg in a S.E. direction to Gebersdorf. 5 Battalions of the 1st Guard Infantry Division which had been in reserve near Schwochow came up and occupied the Kanzel Berg with some of the 2nd Guard Division to ward off pursuit, while the retreat was continued from Gebersdorf to Kunow.

The 3rd Guard Infantry Divison had advanced from Rosenfelde towards Borin and Langenhangen. It had occupied the Hopfen Berg, when a furious counter-attack of the 42nd RED Infantry Division from Borin was launched with such concentrated energy against its left flank, that it could not maintain its position, but was forced to retreat to Langenhangen.

The 2nd Guard Division seeing the mishap of the 1st Division could no longer maintain the forward position it had or the line Leine-Rumprechts Berg. It retired accordingly by the heights S. of Kunow to Rohrsdorf. The units got somewhat mixed during the retreat through the woods S. of Langenhangen. The RED 3rd, 4th, and 41st Infantry Divisions, having overthrown the 1st Guard Division, attacked the 2nd Guard Divison in its retirement near the Kanzel Berg. The Guards were supported by 3 Battalions of the 3rd Guard Infantry Division retreating from the Hopfen Berg, who concealed in a wood west of the Kanzel Berg inflicted some loss.

The Guard Artillery being threatened by the successful advance of RED, the divisional Cavalry of BLUE came into action, and the Guard Cavalry Division, which was covering the flank and rear of the retreating Guard Corps, went about and attacked the left flank of the RED Divisions, attacking the Kanzel Berg with sudden, opportune, and well-led vigour. This enabled the BLUE Artillery and Infantry to make good their retreat, though the Cavalry suffered in heavy proportion for their self-sacrificing devotion. Moreover, they were attacked in turn by the RED Cavalry Division near Künow, and, exhausted by their efforts, were overthrown; but as at Vionville they had fulfilled their object, which was a diversion to

[1] 1¼ English miles S.W. of Wartenberg, ¾ mile E. of Karlshof, which is a large farmstead.

gain time for their Infantry to reform their broken ranks and retreat good time and order.

Evening of 11th September.—The fighting ended for the day with the retreat of BLUE behind the Thue, the 3 Divisions of the Guard Corps extending from Marienthal and Gross Schönfeld on the right to Lindow on the left, the Guard Cavalry Division again at Wildenbruch, outposts on a nearly straight line fronting N.E. from nearly five miles S.E. Bahn, through that place, Heinrichsdorf, and Klein Zarnow to the Reglitz W. of Buddenbrock. RED cantoned from Kunow behind the Thue to Kl. Mellen; its outposts were pushed across the Thue in a great salient arc from Sabow by Gross Zarnow, Liebenow, round to the Thue near Vogelsang. The day's work had been particularly instructive in varied fighting and in forcing Commanders to quick, independent decisions. The 2nd phase of the manœuvres thus closed.

3RD PHASE.

On the evening of 11th September the Director of the Manœuvres gave out the following "SPECIAL IDEA":—

"RED receiving Reports of the assembly of hostile forces on the "lower Warthe detaches its Cavalry Division in the direction of Lands-"berg.[1] Strong Reinforcements[2] reach BLUE from Berlin and enable the "Guard Corps to resume the offensive."

BLUE hereon issued in the night of the 11th the following orders for the 12th:—

The 2nd Guard Infantry Division is to move from Marienthal by Bahn on Kunow.

The 4th Guard Infantry Division is to move from Gross Schönfeld by Liebenow on Gebersdorf.

The 1st Guard Infantry Division is to move from Lindow by Heinrichsdorf on Langenhagen.

The 3rd Guards Infantry Division is to move from Wilhelmsfelde by Stecklin on Borin.

The heads of these columns to cross the Bahn-Lebenow-Rosenfelde high road by 9 a.m.

The Cavalry Corps to operate against the enemy's left flank, starting at 8 a.m.

RED had meanwhile determined to push his advantage of this day, Orders:—

The 42nd Infantry Division to move at 8 a.m. in two columns from Kl. Mellen by Stecklin on Kl. Zarnow; from Mühle, W. of Borin, by Rosenfelde on Heinrichsdorf.

The 41st Infantry Division to move at 8.15 in one column from Gebersdorf by Holbk Mühle on Gr. Schönfeld.

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[1] See General Sketch-Map.

[2] These were represented by RED Cavalry Division transferred, and by a new Division formed by details from the 1st Guard Division, and a few men with flags to mark their position—a Skeleton Division in fact. The BLUE Cavalry were now grouped into a Cavalry *Corps* of 2 Cavalry Divisions.

The 4th Infantry Division to move at 8.30 in two columns from Künow from Unt. and Ob. Mühle on Försth.-Marienthal.

The 3rd Infantry Division to move at 7.40 in one column from Künow by Bahn on Marienthal.

12th September.—In consequence of the above orders the contending forces came into collision from the heights, 1¼ miles west of Rohrsdorf to Stecklin

At 9 a.m. the A.G. of BLUE's 3rd Guard Infantry Division encountered that of the right Advanced Guard of the RED right column at Stecklin. At first the Guard took the village. The 42nd Infantry Division (RED) then assaulted the village and retook it for a time. BLUE, however, outflanked it from Bagershope on the West, and RED had to retreat to Borin.

The 3rd Guard Infantry Division (BLUE) followed to Borin with pushing flanking detachments to Rosenfelde. It had suffered much during the fighting, and could not prevent RED's retreat. Near Borin it received orders to move by Rosenfelde to support the 1st Guard Division, which was severely engaged N. of Liebenow.

The 1st Guard Infantry Division had reached the wood N. of Ferdinandsfelde when the left column of the 42nd Infantry Division, RED (see orders above), came up rapidly from Rosenfelde, and with energetic dash, seized the wood, and the Artillery of the 41st RED Division shelled the columns of the 1st Guard Division debouching from Heinrichsdorf from the heights N. of Liebenow. Attacked in front and in flank the 1st Guard Division placed its Artillery on the heights S. of Ferdinandsfelde, its Infantry on the northern edge of the wood to oppose the right columns of the 42nd Division. To meet the attack of the 41st Division south of the wood it had but feebler forces.

The northern edge was lost, and the situation was critical, when from the right wing of the Guard Corps where things had been going well, help came.

The 4th Guard Division took Liebenow after considerable fighting. It then attacked the 41st Infantry Division RED engaged with the 1st Guard Division, but was driven by it westward of Liebenow. News then arrived of the repulse by the 4th Guard Division, of an attack by the 4th Infantry Division, RED, the occupation of the passage of the stream, and the crossing of the Guard at Obermühle about 10.30 a.m.; therefore RED's left flank was turned.

The 2nd Guard Infantry Division had reached Bahn and was marching on Künow, which the 3rd infantry Division RED was also making for, having detached a left flanking detachment of two Field Batteries escorted by 6 squadrons, by Rohrsdorf towards Neuendorf. Hearing that the BLUE Cavalry Corps had advanced East of the Langer See, the Divisional Commander pushed forward one Infantry Regiment also to overtake the flanking detachment to advance to Marienthal. The main body of the Division then engaged the 3rd Infantry Division RED.

The BLUE Cavalry Corps attacked the flanking detachment and overthrew it, and the 3rd Infantry Division RED was compelled to withdraw to Künow. The BLUE Cavalry, followed by Heinrichshorst,

swung round between Rohrsdorf Künow and fell on the flank of RED's retreating Infantry South of Künow.

The 3rd Infantry Division had suffered a decided defeat.

RED had already decided, owing to the preponderance of BLUE on his left flank, and the defeat of the 4th Infantry Division at Liebenow, on a retreat Northwards. The 4th Division had taken up a rallying position near the east end of Gebersdorf, followed by the 1st Guard Infantry Division. The BLUE Cavalry continued to inflict losses on the 4th Infantry Division South of Gebersdorf, and the fighting round that village was a good example of the action of the three arms in a modern battle-field. The retreat of RED was continued as far as the line Garden-Wartenberg-Babbin. The actual fighting was over by 1 p.m.

BLUE pressed as far as Künow-Gebersdorf only. The Guard Corps was much exhausted, and had suffered such losses that the 4th Guard Division had again to be amalgamated with the 1st Guard Division. The outposts of the contending armies were now about 3½ miles apart.

The BLUE Cavalry Corps was removed on the evening of the 12th out of the sphere of operations.

4TH PHASE.—SPECIAL IDEA.

"On the 12th September, towards evening, RED is reinforced by a "Cavalry Division, the advanced portion of reinforcements that have just "landed at Cammin. BLUE hears of reinforcements coming from "Mecklenberg.[1] To intercept these, RED sends the 42nd Infantry "Division towards Stettin."[2]

13th September.—BLUE had determined upon a bold offensive against the front and right flank of RED with the intention of driving him back on the Madü See by an advance in echelon of Divisions from the right.

With this view BLUE Commander had issued orders for the 13th briefly, as follows:—

The 2nd Guard Division to move at 7.40 a.m. from Künow by Schwochow on Karlshof with a Right-Flanking Detachment on Beelitz.

The 1st Guard Division to move at 7.40 from Gebersdorf by Langenhangen on Woltersdorf.

The 3rd Guard Division to move at 8.10 from Kl. Mellen by Kl. Schönfeld on Garden.

RED.—The Red Army had orders to hold back the BLUE forces as long as possible to give the reinforcements landed at Cammin time to come up into line. The Red Commander thought offensive action would best carry out this intention, notwithstanding his defeat on the 12th.

Orders for 13th.—The Cavalry Division to W. of Sinzlow to reconnoitre on a wide front Southwards, and protect the right flank.

41st Infantry Division near Kortenhagen in two columns along the roads Garden-Kl. Schönfeld-Woltesdorf.

4th Infantry Division N. of Wartenberg in 2 columns along the roads Wartenberg-Beelitz.

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[1] BLUE had for this phase been deprived of both its Cavalry Divisions.

[2] This Division accordingly took no further part in the actions.

3rd Infantry Division near Alt Falkenberg in 2 columns along the roads Leine-Schützenau-Isinger.

RED occupied positions from Klein Schönfield-Hopfenberg to Fuchsberg and Beelitz as soon as the advance of BLUE was reported, and a series of fights took place with varying success all along the line. The RED Artillery was well handled, and it was judged that RED had fulfilled its mission of arresting BLUE's advance. BLUE's loss was adjudged heavy, and it could not renew the attack, but had swung round its left so as to front nearly E., while RED fronted W. and S. The outposts being within a mile and a half of one another towards the N. while on the S. they were further apart.

14th September.—For this, the last day of the manœuvres, a further Special Idea was given out by the Director as follows:—

"RED's 42nd Infantry Division which had been sent to Stettin to "oppose the reinforcements coming from Mecklenburg has been beaten "and forced to retreat N.E. to Gollnow, BLUE following in pursuit to "Altdamm."

In order to carry out this idea the 42nd Infantry Division is now added to the BLUE Forces. Their outposts have extended from Mühlenbeck beyond Kolow front S.E. BLUE Cavalry Division with two Machine Gun Detachments have been sent round Eastwards beyond the Madü See, and have reached Moritzfelde Künow[1] with the object of severing RED's communications.

RED occupied a defensive position from the heights about Sinzlow to Babbin about 4½ miles long, all the high ground and the Keck Graben stream being held in 2nd Line. His orders were to hold his ground at all costs. A RED Cavalry Brigade of 6 squadrons was at Binow, and the Cavalry Division behind the Fuchsberg, north of Leine.

BLUE had issued following orders:—

3rd Guard Infantry Division to advance by Wittstock by Glien See to Glien.

1st Guard Infantry Division to advance by Garden by Glien See to Sinzlow.

2nd Guard Infantry Division to advance by Kl. Schönfeld by Woltersdorf to Wartenberg.

The Guard Cavalry Division was to bar the enemy's retreat by Neumark, supported by the 42nd Infantry Division (now BLUE), which was concentrated at Kolow, and was to turn RED's right by the Mühlenbecken Först. RED was obviously in a critical position, and to carry out his orders he had to resort to Field Fortification; trenches with overhead cover, Gun Pits, etc. It was necessary to hold the front with a thin line in order that strong reserves might be echeloned to the rear, so as to oppose any turning or surrounding movements with adequate forces.

For this there were in reserve the main body of the 3rd Infantry Division nearly a mile south-east of Kortenhagen, and 3 battalions, 1 squadron, 3 batteries about a mile North of Babbin.

[1] This is Künow am Madü See, and must not be confounded with Kunow by Gebersdorf.

BLUE.—It was necessary for BLUE to prolong its line to the left to get in touch with its 42nd Infantry Division at Kolow, and prevent its being isolated.

BLUE marched very early, so by 6 a.m. the 3rd Guard Division was at Wittstock, 1st at Garden, 2nd at Kl. Schönfeld.

RED reports came in at 7.15 showing the massing of troops about Kolow, and the apparent intention of moving them to Neumark. Then of Cavalry, in large numbers in his rear moving on the same place.

BLUE Commander ordered at once:—

1. A strong counter-attack by the whole 3rd Division in General Reserve at Kortenhagen against Glien and Kolow.

2. The movement of the mixed detachment kept in reserve north of Babbin to move at once on Neumark.[1]

At about 8 a.m. the 41st Infantry Division (RED), which was holding the villages of Sinzlow and Kortenhagen, and the high ground, was assailed by the 1st and 3rd Guard Infantry Divisions (BLUE), after a preliminary bombardment by a long line of guns on the heights between Neuhaus and Garden. Nine Battalions of the 4th Infantry Division RED were ordered to make a strong counter-attack, as a diversion, to relieve the 41st Division from the pressure of this attack. The counter-attack fell on the 2nd Guard Division in its advance on the right, and checked it for the time. But Sinzlow was taken by the 1st and 3rd Guard Divisions about 8.45 a.m., and Kortenhagen about 10.20. The 41st Infantry Division BLUE was therefore compelled to retreat, and retired across the Kreck Graben towards Neumark. The 4th Infantry Division retired to Schützenau on the Neumark road.

The great counter-attack of RED'S 9 battalions, 8 batteries of the 3rd Infantry Division failed, for it encountered both the 3rd Guard Division and part of the 41st Infantry Division, and it was compelled to retreat to Neumark, followed up in rapid pursuit by the 3rd and part of the 1st Guard Infantry Divisions.

The 41st Infantry Division suffered severely in its retreat over the Kreck ground from Artillery and Machine Gun fire.

The Grand Cavalry Division attacked these exhausted troops between Neumark and the forest, thus completing their overthrow and deciding the victory in favour of BLUE.

The manœuvres concluded about noon.

COMMENTS.[2]

Although the strategical situation was occasionally somewhat strained, yet the manœuvres of 1900 were admirably planned, and showed the character of real warfare of the present day better than any previous peace manœuvres. Account was taken of modern conditions of war and

[1] Babbin to Neumark 4½ miles.

[2] These are translated. I have not added my own. The German reviewer is apparently a tactician of the von Scherff school as opposed to that of von Schlichting, who is said to have inspired the present German Drill Book.—TRANSLATOR.

warlike appliances. Wireless telegraphy was used up to 28 miles. Motor-cars and cyclists were made use of, as well as a perfected pigeon-post system, the field telegraph, and signalling. As regards the solution of the Strategical Problem and its unreality, it has been criticised that RED sent its Cavalry Division and the 42nd Infantry Division at the outset to Bahn instead of seizing the bridges at Stettin at once, to be followed rapidly by another Division. This would have secured the passage, and at the same time have covered the intended Line of Communications to be opened on the fall of Swinemünde. Possibly, but in this case there would have been no attack and defence of the river-line of the Oder, which it was one of the objects of the Director of the Manœuvres to bring about. Nor would the Cavalry have had such good practice in their reconnaissance duties which the preliminary operations of the first phase of the Manœuvres (up to the 8th) in the advance to the Oder, etc., afforded. The object of Manœuvres is to bring about certain tactical situations which will give practice to commanders and leaders of all arms and to the troops of as varied a nature as possible, and in as natural a manner as peace conditions admit of. This was fully accomplished, and on the whole good scope for independent judgment was left. Five different problems were carefully worked out, a nd although the area was somewhat restricted, and consequently the same ground was gone over two or three times, yet this is what often happens in war, and, on the whole, much variety in the situations was effected and were taken advantage of. The Guard Corps is said to have adhered too much to close formations, and to have carried out the system of reinforcement by the second line, which under present conditions of fire is impracticable. The cavalry are said to have executed impossible charges *en masse*, and the Artillery to have heroically sacrificed themselves by rushing forward unnecessarily into the zone of Infantry fire, which the longer effective range of artillery renders superfluous.

Certain close formations must still be practised in peace to counteract the loosening effect which real war soon brings about. Cavalry must practise charging on large bodies, though in war opportunities for such may be few and far between. Artillery must closely support their Infantry, because the moral effect of the working together of the two arms is of more importance than taking advantage of its longer range.

On the whole, these Manœuvres may be said to have shown that the German Army is in a high state of efficiency and training, and that its progress year by year is assured.

NATIONAL RESPONSIBILITY.

By Major-General J. B. STERLING.

An Address delivered at the General Meeting of the Brighton and Hove Branch of the Army League, 15th January, 1901, and reproduced by permission of the Council of the Army League.

I HAVE been invited by the members of the Army League at Brighton to address you, and the acceptance of the offer has given me pleasure. It may be permitted to me to sketch in a few words the salient points of that which I consider to be sound policy for the country in military matters. I have strong predilection for such an organisation of the War Office as will entail decentralisation and consequent personal responsibility: for an adequately equipped, trained, and organised force, ready for prompt action, and with rapidly elastic reinforcements, all of the Regular Army and all of the first line, in addition to the Army in India and its feeding depôts. There is no constitutional objection to a considerable Regular Army in the present state of popular representation.

The Militia should stand on its own base, in the first place to act as second line, but available at small interval for a wide-ranging employment. Finally, the Volunteers should form an efficient third line for local garrison and for a home field army, and I hold that skill and prevision in organisation will necessarily lead, in the long run, to sound economy. This war has cost a hundred millions in money, the wiping out of four millions of economies for twenty-five years, and someone must foot the bill; in addition to the monetary cost that can be liquidated, a vast amount of suffering has been inflicted which time may assuage, but can never efface.

I am present here not as an individual to air my own ideas on Army reform, but as a representative of the Central Committee of the Army League, who are desirous of urging you to think over the grave responsibilities that always rest on citizens of a free country; these responsibilities have been brought into prominence by the Prime Minister and by the Leader of the House of Commons during, and previous to, the electioneering campaign lately closed. The man in the street is now in a different position, according to those eminent persons, from that allotted to the "Messieurs du Pavé" in the Bismarckian creed held at the time of the siege of Paris. The man in the street is officially quoted as being the typical arbitrator of the standard of knowledge demanded by the highest interests of the nation, not only for its population, but also for the members of the Government, who are responsible to the electors for the conduct of public affairs; the man in the street must think; it is advisable, as a preliminary to better things, to think wrong than not to think at all, and Gallio, who "cared for none of these things," has left many descendants.

We must rise to our responsibilities. These matters are far apart from party politics, from the politics of the "Ins" and the "Outs," and we can ungrudgingly admire the ardent patriotism, lucidly expressed by the German Chancellor in his Reichstag speech of 12th December—a great speech if actually delivered as reported; a sound standpoint for the Government of any country is fixed by the statement:—"So long as I stand in this place, I must protect the peace and prosperity of the nation, against all interference and all perils, from whatever side they may come, as is my duty and my obligation."

Orators frequently talk ineffable nonsense, but of such in this case there is no trace, and it is not in every country that statesmen holding office boldly grasp responsibility instead of dallying with repudiation.

The war in South Africa has made clear the undoubted fact that in the autumn of 1899 this country, as regards its military development, was inadequately prepared for that standard of military efficiency which the safety of the Empire demanded—then—and the demand continues.

It is useless for us to enter into recriminations over past troubles by endeavouring to apportion the aliquot parts of blame that may lie respectively on the shoulders of the civilian or of the military portions of the official hierarchy; it is sufficient for the moment for us to accept the position that preparations were inadequate, and with Shylock we must "have an oath in heaven" that, according to our lights, no such neglect shall again arise.

There is an article in the *Contemporary Review* for this month on the War Office; it was constantly before me during the perusal that I should find at the end the signature of the learned Dr. Pangloss; in that I was disappointed; the Latin word "Togatus" stands for that which Junius called the "nominis umbra." "Togatus" holds that, subject to unimportant alterations, the working of the War Office proves it to be a machine suited to the needs of the Empire. The answer, of those who differ from the writer, is that not in men, not in *matériel*, not in organisation of the two, have the needs of the Empire been attained. If you seek a monument South Africa exists.

A bald statement of the case is this: Strained relations had been prolonged over many months between Great Britain and the then President of the Transvaal. At least, as early as June, 1899, if not at the period of our first backing the Uitlanders' franchise claims, war was clearly a possible, if not a probable, outcome of the crisis. The Government of this country hesitated to push forward military preparations, as the evidence of active preparations might accentuate the crisis, and perhaps rupture those peaceful negotiations which it was hoped might stave off the necessity for war. As a result war was declared by the Government of the Transvaal, and, marvellous to relate, by that of the Orange Free State. We were met with aggression while still unprepared. Great numbers of men, animals, and stores were hurriedly gathered for transportation to an assured base 6,000 miles away—not only from the mother country, but also from the garrisons of India; expeditionary forces of all arms were rushed to the seat of war. On the whole the

transport arrangements were efficient, but the number of fighting men estimated to be adequate in the earlier stages were found to be altogether insufficient.

The Army of India is constantly on a war footing, and units were promptly ready for embarkation, without the portentous weedings and supplements that were universally necessary before those on the home establishment were fitted to take the field.

By the 20th November, 1899, 32,000 men had been landed; in addition 20,000 and three detachments of Australians were on the seas.

On the 11th December, the date of Magersfontein, 12 cavalry regiments, 4 batteries Royal Horse Artillery, 18 batteries Field Artillery, 2 batteries Garrison Artillery, 50 infantry battalions, in all more than 60,000 men had landed.

By the last return that I have seen there are now in South Africa 17 cavalry regiments, 54 batteries, 16 artillery companies, 114 battalions, 20 Yeomanry battalions, scores of colonial corps, together with other details, and more are on the seas. The country at home was denuded of all formed and efficient units, but her virility, moral and physical, saved the face of the nation. Before Christmas Lord Roberts had started, and the country, thoroughly aroused, was preparing artillery, horse soldiers, and infantry, all improvised, and none too soon.

It is curious to read in Walpole's letters to Mann of the year 1745, these words :—"The good people of England have at last rubbed their eyes and looked about them. A wonderful spirit is arisen in all counties and among all sorts of people. The Archbishop of York has set an example that would rouse the most indifferent; in two days after the news arrived at York of Cope's defeat, the Bishop made a speech to the assembled county, that had as much true spirit, honesty, and bravery in it, as ever was penned by an historian for an antient hero."

Walpole describes the raising of regiments throughout the country, a process consuming much time, and for which the suddenness of modern war will never again allow the leisure.

With the arrival of Lord Roberts at the Cape in the latter part of January, a new era opened: under the stress of war, the country and the Government were learning that the *rôle* of land forces must be the offensive, and history teems with examples, from the days of the Punic Wars, through the Peninsular War, and past the Crimean War, and experience now landed us on sound principles in South Africa. We defended the frontier of the Cape Colony and the Capital of Natal, when threatened by formed armies, by attacking the enemy, and not by passive defence.

Let the Government assimilate this principle, and we shall hear little more of the defence passive by our land forces, an idea which since 1860 has persistently worsened our strategical position.

We all know the line—

"Thrice is he armed that has his quarrel just,"

the elect are cognisant of the American addition—

"But four times he that gets his blow in first."

Napoleon at the beginning of the past century had grasped this elementary principle, so had the French colonels in 1859, and General Mercier keeps alive in our day a similar idea, but the superstructure, imposing as it may appear on paper, lacks in their case the primary foundation necessary for a solid edifice; in order to carry out successful offensive war the routes of advance must be cleared; the routes from any part of the Continent to this country are for a moment—prolonged over some centuries—not cleared for an invader, neither were they in the beginning of the last century, nor in its middle, and whilst Great Britain lasts as an Empire they must be permanently and effectively obstructed to our enemies, as they were in Elizabeth's time, and free to our friends and to ourselves.

The country had once and again underrated the strength of its antagonist. Strenuous efforts to repair the earlier neglect were put in force on all sides: Great and Greater Britain ran game. The Fire brigades have long ago learned their lesson. A gallon of water on the spot may save a conflagration.

Political stress refused the gallon, and we had to master the conflagration.

It is not easy to improvise an Army largely in excess of the normal and organised forces of the country; numbers were found, but organisation was inchoate. The batteries of artillery at home had been depleted of men, horses and guns; the cavalry regiments were in an equally enfeebled state; the infantry battalions were in skeleton formation, but men in numbers were raised, partly by Government measures, largely by private enterprise.

Greater Britain scored to the cry. Canada by March, 1900, had raised 3,000 Volunteers, Australia 4,000, New Zealand 750, India and Ceylon 400. All these had landed in South Africa, and in July Canada sent 2,000 additional men, Australia 1,000, and New Zealand doubled her original contingent, and the flood tide from the outlying Colonies has again set in.

There were at least 20,000 men raised in Cape Colony and 7,000 in Natal; more perhaps were raised, but some were discharged, and the returns are confused. In the past few weeks Cape Colony and Natal have raised many additional corps. Thus some 40,000 over-sea Greater Britons heard their mother calling—and came: an unrehearsed lesson to ourselves and to others, of some importance.

Of the Home forces, 40,000 Militia were embodied, and 16,000 of these, as I count, but perhaps more, went abroad, for the most part to subsidise the county regiments to which they were affiliated, and some in their own units, at various times, to garrison stations, such as Malta, Gibraltar, and St. Helena, as well as to South Africa.

The Yeomanry, 12,000 strong, were unorganised for war, and a new force was moulded: it consisted of twenty battalions—note the term—each 500 strong; some Yeomanry, some extraneous recruits; these were hurried to the front, and verily they have done the State some service.

At the outbreak of the war, the Volunteers were numbered on paper at about 230,000 men, and this number automatically increased under the war fever, stimulated by the cry of the Empire in danger. Some sixty-six companies were specially formed, and they joined various regiments in the field. One remarkable corps, 1,600 strong, the City Imperial Volunteers, went out in January as a complete mixed unit of mounted men, foot, and guns.

A quarter of a million men had taken the field, and 20,000 in reserve regiments were easily raised for Home service, but whether or not a £22 bounty is sound finance for payer or payee remains a disputable point.

This great effort was an unjust strain to be thrown unwillingly on the resources of the country, and it is with a view to urge the nation, without haste, but without rest, to organise in time lest a greater evil befall us, that the Council of the Army League have called this meeting.

The world is loaded with combustibles, not only physical, but moral, not in Europe alone, but widely far afield. The home prophets are misleading; but six months ago a statesman of mark from India said in obscure language, but with clear meaning:—"The lessons to be learnt from the results attained in Egypt, West Africa, and the Fashoda question, and now that the South African question is within sight of a satisfactory termination, is this, and I beg you to take the facts into consideration: If the country is going to stand in Asia, will there ever be a better opportunity for standing than now, when the country has been triumphant in Africa, and when at last they have created an Army?"

Von der Goltz, a voluminous German writer, says:—"War with England supposes a powerful Navy, and we must not lose a day in preparing for the struggle. Victories cannot be improvised, and the German War Budget for the year prophesies £2,000,000 for further armament of the Artillery!"

We envy the results of a well-organised system of education in Germany; for me, I have unstinted admiration of their logical preparation for the struggle for existence on other lines.

Germany has not lately had the painful object-lesson of war stopping her food supplies, but she has reasoned out the possibility of such an event, and an improvised Navy is one step more difficult than an improvised Army.

The mechanical and manufacturing skill of this country must be called upon to bear its part; we had a curiosity shop of a score of sorts of guns in the field; the Boers had but eight types.

Our Regular soldiers were intermingled in hotch-pot battalions with Militia and Volunteers. The very units of the Regulars themselves are undecipherable, not least in the Artillery. The professional magazine of that Royal Regiment contains the following note:—

"Every effort has been made to make this list as accurate as possible, but divisions have been broken up and others formed; new brigades have been formed, brigade divisions of Royal Field Artillery have been reposted to other divisions, and have been themselves often broken up, and in some cases, fresh brigade divisions formed, so that it is impossible to trace

the positions of many units. Less information even has been published about the Royal Garrison Artillery, so it is regretted that it is impossible to locate most of the companies."

We must above all things avoid undue assurance as to warlike or other hazardous forecast.

Napoleon was the greatest expert of war since the days of Cæsar, with whom, and with Alexander, he claimed an equality in the Triumvirate of the world's supreme military leaders.

At the treacherous occupation of Madrid in 1808, Napoleon said: "I have occupied the Capital, and the war is at an end"; but the Spanish ulcer ran for seven long years. I seem to have heard a faint echo of a similiar cry within the past few months.

1809 saw Vienna, for the second time, occupied by French troops, and the patched-up Peace of Schönbrunn gave him his second wife; but the proclaimed cessation of war was no peace, either international or domestic.

The occupation of Moscow was, for the third and last time, the clear self-proof of conceited masterhood; the down-hill grade had begun, and a Daniel might have deciphered that St. Helena or another Nemesis was looming.

Nations, like people, are wofully the sport of chance; but against mischance, men, in bodies or isolated, who are wise, make fair preparation.

"Lest we forget" the parable of the untrimmed lamps, we have it in five lines, by a true Briton, the biggest human author of all time, put into the mouth of the Dauphin of that country, whose words in our time leave something to be desired :—

> "For peace itself should not so dull a kingdom
> (Though war, nor no known quarrel, were in question),
> But that defences, musters, preparations,
> Should be maintained, assembled, and collected,
> As were a war in expectation."

TO INDIA:
MILITARY, STATISTICAL, AND STRATEGICAL SKETCH.—PLAN OF FUTURE CAMPAIGN.

Translated from the Russian of B. T. LEBEDEV,

By Lieutenant H. C. HOLMAN, 16th Bengal Cavalry.

[For "Introduction, First Campaign and Seizure of Herat," see JOURNALS for November and December, 1899, and January, 1900.]

(Continued from p. 65, January, 1901.)

"The more powerful Russia becomes in Central Asia, the weaker does England become in India, and, consequently, the more amenable in Europe. —*A. Sobolev.*

CHAPTER XIII.

SECOND CAMPAIGN.—OPERATIONS TO KABUL FROM THE DIRECTION OF THE TURKESTAN MILITARY DISTRICT.

As soon as the campaign against Kandahar is decided upon, and the Caucasian troops begin their advance on Herat, the troops detailed to form the Kabul Force should commence their movement on Mazar-i-Sherif, their point of concentration. The following may be considered the shortest and most suitable routes leading to the said town:—

i. For the troops concentrated at Samarkand—from Samarkand, *viâ* Kitab, Chirakchi, Huzar, Derbent, Shirabad, Patta, Hissar, 230 miles. This is the only convenient route, from a military point of view, suitable for wheeled traffic; it passes through a healthy and populous country, and along it, or close to it, are situated the most important places in the whole of Bokhara. The troops would find plenty of water, and that of the best quality.

The establishment of a line of communications along this route would enable the Russian garrisons to watch the most restless and warlike tribes of Bokhara.

ii. The Fourth Rifle Brigade, located at Dooshak, as a reserve to the Herat Field Force, would move from that station alongside the railway to Merv and Charjui, thence by the left bank of the Amoo Daria to Karki, and thence to Shibirkhan and Mazar-i-Sherif, 420 miles.

It is not probable that there would be any difficulty in supplying the troops, because the route lies almost entirely through our territory and, moreover, runs partly with the railway, and partly along a navigable river, the Amoo Daria.

iii. The Turkestan Rifle and Line Brigades would move from Herat to Mazar-i-Sherif by the route Herat—Kala-nau—Bala Murgab — Maimana — Daulatabad — Shibirkhan — Mazar-i-Sherif, 396 miles. This route presents considerable difficulties, but is practicable for infantry, cavalry and mountain artillery. By advancing along it, and garrisoning the principal places on it, we should secure a connecting link between the Kabul and Kandahar Forces, and be in a position to support a rising of the local population, which is dissatisfied with the Afghan Government.

The supply question would present no difficulties, provided the troops took fifteen days' supplies with them,[1] which would be replenished at Bala-Murgab, Maimana, Daulatabad, and Shibirkhan.

Thus, the component parts of the Kabul Force would arrive as follows:—

a. The Samarkand troops at the crossing of the Amoo Daria in twenty days.

b. The Brigades from Herat at Mazar-i-Sherif in thirty-two days.

c. The Fourth Rifle Brigade at Mazar-i-Sherif in thirty-five days.

On the approach of the troops from Herat, the 1st Turkestan Line Brigade would advance to Shibirkhan; the troops which had reached the Amoo Daria from Samarkand would not cross the river, but await the arrival of the troops marching on Mazar-i-Sherif, from Herat and Charjui, in rear of the Afghans guarding the Amoo Daria, who would, thanks to this manœuvre, have to retire and give the crossing to us without fighting.

Thus, the whole of the Kabul Force could be concentrated at Mazar-i-Sherif on the thirty-fifth day after the receipt of orders to do so. Allowing five days for rest and for preparations for a further advance, it could commence its advance on Kabul from Mazar-i-Sherif on the fortieth day.

The principal route connecting Turkestan with Afghanistan passes through Mazar-i-Sherif and Bamian. The distance from Mazar-i-Sherif to Kabul is 380 miles, or twenty-three marches. The chief difficulty met with on this Bamian route would not lie in the crossing of the mountains, but in the narrow, steep ravines between the plains of Turkestan and the upper valley of the Bamian River. The route is essentially one for pack animals, for the difficulties in the way of wheeled traffic would be enormous, in places.[2] The rate of advance on Kabul will

[1] The longest distance between large populous places is a fifteen days' march (Herat to Bala-Murgab).

[2] Field artillery passed over this route in the 1839-42 campaigns. Afghan artillery was also taken over it several times by Mohamed Sherif Khan and the ex-Amir Yakub Khan.

be, in all probability, regulated to a great extent by the number of forts and fortified places occupied by the Afghans on the way.

As the whole of the trade between Turkestan and Kabul passes through Bamian, there are no good roads east and west of that route, leading to the capital of Afghanistan. Between Balkh and Kabul, however, Afghan troops have made use, on several occasions, of the route which follows the course of the Balkh River, and, turning the lofty, snowy summits of the Koh-i-Baba on the west, descends into the upper valley of the Helmund, which communicates with Kabul by the Unai Pass. To the east of the main route, two pack roads lead from Kunduz to the Pianjir and Gurbend Passes. These divide into several paths, leading across the Hindoo Koosh, and unite again into one road, leading to Kabul, at the town of Charikar.

Before we go on to the planning of the advance of our force to the Afghan capital, we will indicate the probable disposition of the Anglo-Afghan troops for its defence, and the nature of the latter.

The Afghan troops which could oppose us on the line of operations — Mazar-i-Sherif — Bamian — Kabul — would, according to the statistics of 1893,[1] be :—

a. 12,000 men, concentrated at Mazar-i-Sherif.

b. The Kabul garrison of 10,000 regulars and 4,500 irregulars.

Of the 50,000 English troops which might, as we have already deduced, be detached for the defence of the routes leading from the Turkestan military district to Kabul, Chitral, and Gilgit, 10,000 would be sent to defend the line Chitral—Gilgit, and 40,000 would be left on the line of operations, Peshawar—Kabul—Mazar-i-Sherif.

The 40,000 men would, in all probability, be distributed as follows :—

10,000[2] on the line of communications to Peshawar.

10,000 in Kabul
10,000 in Jalalabad } or the whole 20,000 in Kabul.
10,000 in Ghazni.

The idea in placing troops at Ghazni would be to threaten the right flank of the Kabul force, and, in case of necessity, to directly support the troops located in Kabul or Kandahar.

The general character of the opposition which we may expect to meet with on our way to Kabul will, probably, be as follows :—On the approach of our troops to Mazar-i-Sherif from Herat, the Afghans will, probably, evacuate the latter place without fighting, and retire on Bamian, delaying our troops by occupying fortified positions on the way. On reaching Bamian, they will receive reinforcements from the garrison of Kabul,[3] and defend the passes across the Hindoo Koosh and Pagman mountains. The Anglo-Indian troops concentrated at Kabul might either reinforce the Afghans defending the passes, or meet the Russians in prepared

[1] *The Nineteenth Century*, No. 195, May, 1893.

[2] It is quite possible that this force may prove insufficient.

[3] The Amir would scarcely send a large force from Kabul, for the capital is the centre of unrest and cannot be denuded of troops.

positions in the neighbourhood of Kabul. Lastly—the best thing for us—the English might leave Kabul and occupy the defiles on the way to Peshawar. This might happen if the communications of the English were threatened, which would be the case in the event of the success of our operations in Chitral and Gilgit, and of a rising of the tribes in rear.

The 10,000-strong Ghazni detachment, detailed to act against the flank of the Kabul force, would, after securing the goodwill of the Hazaras,[1] move into the valley of the Helmund by the route leading from Ghazni by the Bokan, Sar, and Khovat passes.

General MacGregor, who bases his plan for the defence of the approaches to Kabul on operations against our communications, says that 20,000 men sent by the valley of the Helmund to Herdan-Divar, a point on our line of advance, between the passes over the Hindoo Koosh and Pagman mountains, would alone suffice to arrest our movement on Kabul. He contends that an advance to the latter place would then only be possible after the defeat of the English troops in the valley of the Helmund. But this would not be easy of accomplishment, because the English general would be instructed to decline a decisive engagement, and, consequently, the Russian troops would only be able to get rid of the Ghazni detachment by pursuing it to such a distance as would expose the communications of the Kabul force with the North to blows from the English troops concentrated at Kabul.

The Ghazni detachment would, in all probability, be told off to organise bodies of Hazaras, who would be sent, under British officers, against our rear.

As we have already seen, there are several routes by which the Kabul force can advance on the Afghan capital. The principal of these is *viâ* Bamian, the others being one to the west of it, and one to the east, from Kunduz. Small detachments could be sent by these side roads to safeguard the flanks of the main force. A movement along the western route would, however, be a risky undertaking, for the road is little known, and passes through the country of a warlike and, possibly, hostile population, and, above all, leads in the direction of the Helmund valley—a probable *rayon* of operations for the Ghazni detachment and its Hazara allies. Thus, a weak detachment would be exposed to the risk of annihilation, whilst a strong one would weaken the main force.

The advance of a small force from Kunduz on Kabul, *viâ* Narun, Khindjan, and Charikar, would be quite in accordance with the general plan of operations; for, besides securing our left flank, it would serve as a connecting link between the main body of the Kabul force and the Chitral detachment. It would also, with the latter, bring the whole of the eastern portion of Afghan-Turkestan under our influence. Moreover, the Kunduz detachment would safeguard the rear of our force, during its advance on Kabul, from the direction of Charikar, after crossing the passes of the Hindoo Koosh. At the same time, it would threaten the rear of the English defending these passes. In order

[1] Otherwise, operations in the country of these warlike tribes would be exceedingly difficult, if not impossible.

to secure our flank from the direction of the valley of the Helmund, it would be necessary to fortify the passes over the Hindoo Koosh and Pagman mountains—passes which lie in or near the main line of operations; also to select and fortify positions on the road leading from the valley of the Helmund to Herdan-Divar. After leaving sufficient forces to guard these positions, we could move with the remainder on Kabul.

The operations for the occupation of the Afghan capital would be complete when the English troops had been driven back in the direction of Peshawar, beyond the mountains surrounding the Kabul plain. The passes across the said mountains on the right bank of the Kabul River, Jagdalak and Karkacha, and the Shaturgardan mountain pass, leading to the valley of the River Kuram, should be occupied by our troops and fortified. The town of Ghazni should also be occupied by a garrison. The operations of the Kabul force, during the second campaign, would, in all probability, terminate with the occupation of the points indicated and the location of the main body at Kabul.

But if the English confine themselves to the defence of the defiles on the line of operations Kabul-Peshawar, and commence to move their troops thence southwards to Kandahar or Pishin, our Kabul force should, after leaving a sufficiently large garrison in Kabul, commence an energetic advance on Peshawar. We select Peshawar, and not Kandahar, *viâ* Ghazni, because the latter direction would take us through a possibly hostile and, in any case, a treacherous population. Moreover, the English, finding themselves between our two forces, might inflict a defeat upon the weaker Kabul force by taking advantage of interior lines In addition to all this, by leaving Kabul for Kandahar, we should restore all the newly-acquired territory to the Afghans, for it would be impossible to leave a sufficient garrison in Kabul to hold the country, without weakening the Kabul force to such an extent as to make its hazardous movement on Kandahar an impossibility. An advance on Peshawar would bring our Kabul force closer to the Chitral detachment and the revolted tribes north of Peshawar, which would all strengthen the Russian threat against the northern frontier of the English, and prevent them from sending a single soldier to Kandahar.

Barring all accidents[1] which might take place during the concentration of the troops of the Kabul force at Mazar-i-Sherif, and their advance on Kabul, we may assume that, allowing for the ordinary halts, our troops would reach the Afghan capital on the seventy-first day after the declaration of war.

It is quite possible that, thanks to the small carrying capacity of the Trans-Caspian Railway, and the absence of a branch line from the latter to Herat,[2] the Kabul force might reach the line Kabul-Kandahar considerably sooner than the Kandahar force. Moreover, the English might delay the advance of our troops from Herat by moving out to meet them,

[1] Difficulty in obtaining supplies; and difficulties of the country, as well as those created by the enemy.

[2] Now almost an accomplished fact.—TRANSLATOR.

and by holding a series of previously fortified positions. By thus delaying the Kandahar force, and by concentrating considerable forces against the Kabul force, *i.e.*, by working on interior lines, the English might strive to defeat the latter. Then, having settled with the Kabul force, they might concentrate on the southern theatre of operations, and try conclusions with the Kandahar force, with certain chances of success.

Admitting such a plan of defence, we must assume that the English would strongly hold the passes over the Hindoo Koosh, to cover the concentration of their troops on the Kabul plain, where large forces could easily be deployed. The advance of the Kabul force might certainly be very risky, but the advantages it might secure are also great. The occupation of the Afghan capital, and the defeat of the English under its walls, would as surely destroy the prestige of the latter as it would raise ours. A great impetus would be given thereby to the unrest in India itself, and the English would, consequently, be prevented from reducing the garrison forces to reinforce the troops which would be sent to meet our Kandahar force.

It will be seen from this how important it is that a victory under the walls of Kabul should precede the decisive battle which must be fought on the southern theatre of operations. Even to gain the advantages we have indicated, however, the Kabul force should not try conclusions with any greatly superior English forces at Kabul, and thereby run the risk of a defeat, which would irrevocably place the game in the hands of our enemy.

A bold advance on Kabul is only possible if all indications point to the fact that the English do not intend to act on interior lines. This would be shown by the absence of a general reserve somewhere on the line Lahore-Jhelum, and the concentration of considerable forces at Kandahar.

Otherwise, our Kabul forces should, at all costs, occupy the passes over the Hindoo Koosh and Pagman Mountains, fortify themselves, and wait till the Kandahar force is equally well advanced.

CHAPTER XIV.

The Arrangements for the Provisioning and the Safeguarding of the Rear of the Kabul Force.

The Turkestan military district, in particular the Samarkand province, will be the base of the Kabul force; and the line of communications will be the actual track of the force in its march on Kabul.

Let us make a rough acquaintance with the capabilities of the base and zone of operations of the Kabul force. We have more minute information about the province of Samarkand. From the "Review of the Sarmakand Province" for 1888 we learn that in the Samarkand and Katta Koorgan provinces they gather upwards of 12,500,000 poods (pood=40 Russian pounds) of wheat and rice, and nearly 8,000,000 poods of barley and other grains. For the feeding of the population of the two provinces, calculating at the rate of 15 poods a year, there would be required about 7,500,000 poods of wheat and rice; consequently we have a

surplus in these two provinces alone of 5,000,000 poods of these two grains, not taking into consideration the enormous mass of other grains. From the "Review of the Samarkand Province" of 1892 we learn that the cattle-breeding in this province is very extensive, as the following figures show: 106,000 horses, 154,000 cattle, 523,000 sheep, 40,000 camels, 49,000 asses. The Samarkand and Djizak provinces are especially rich in horses, but only the latter in camels (30,000).

It is impossible to give any definite information as to the amount of grain grown in the Bokhara khanate; we can only point out districts where agriculture not only fully satisfies the wants of the local population, but even produces a surplus. Thus the valleys of the Shaar-Sabiz and the Chikachik and Guzar vilayets are looked on as the granary of Bokhara; then the richest of all are the vilayets of the upper part of the Gurkhan valley and Gissar; and the largest surplus of grain occurs in the vilayet of Shirabad.

The chief grain markets in Bokhara are the towns of Bokhara and Karsha, where are always considerable supplies of grain for the daily use of the population and also for trade operations. Second-rate grain markets are the towns of the Guzar, Oorchi, Deunaw, and Shirabad.

The number of various breeds of animals is even more difficult to fix than the actual crops. One can, however, make the general observation that cattle-breeding is fairly well developed, and fully satisfies the wants of the population; cattle-breeding is best carried on along the Hissar range and on its off-shoots. The chief markets for the sale of cattle, horses, and camels are the towns of Guzar and Karsh.

As regards the food-producing capabilities of the zone of operations of our force on Afghan territory we have very general information. The whole of Afghan Turkestan may be divided into three strips, lying east and west: sandy plain (45 to 50 versts wide), cultivated plain and mountainous. The best cultivated are the oases at the foot of the mountains, where the rivers descend on to the plains; the strip of these oases is but of slight width, but well cultivated, and, thanks to artificial irrigation, gives very good crops.

The mountainous strip is mostly pasture land. In consequence of the lack of all trade, the agricultural population simply produce just enough for their immediate wants, and do not accumulate any stores. Then, again, the neighbourhood of Kabul is densely populated, excellently cultivated, well irrigated, and furnishes all the conditions necessary for the provisioning of a considerable force from purely local sources.

At all events, at the commencement of our troops' advance towards Kabul it will be impossible to rely on local supplies, as they may be destroyed by the Afghans, and therefore it would be better to take with us supplies for the whole route to Kabul.

The general character of the provisioning of the Kabul force during its advance will be the following:—

A. During the concentration of troops on Mazar-i-Sherif, provision depôts and transport will be arranged at Samarkand, Guzar, and Shirabad, the main and intermediate bases. Thence all provisions will be transported

to the fords across the Amoo Daria. Hither also will be driven the necessary supply of transport animals for the conveyance of a month's provisions for the troops of the Kabul force. This will all, as soon as we have occupied Mazar-i-Sherif, be moved to the latter place, where will be collected transport for the further advance. On the day after the march of our troops out of Mazar-i-Sherif, transport with one day's supplies for the whole force will be started off after our troops, next day a similar transport, and so on—*i.e.*, a circuit of transports will be organised. As the force advances, intermediate bases will be formed at Geybag and Bamyan.

As soon as the Trans-Caspian Railway has finished conveying the troops for the Kandahar column and its reserve, and it becomes possible to tell off a portion of the rolling stock for the use of the Kabul column, then, in all probability, loads from Samarkand for Mazar-i-Sherif will go from Samarkand by rail to Charjoi, and thence by the Amoo Daria to the above-mentioned line of communications.

The Amoo Daria flotilla will consist of 2 steamers, each of 530-I.H.P., and two iron barges, carrying 10,000 poods apiece. Should the capabilities of the flotilla prove insufficient, it will be possible to organise a flotilla of Khivan and Bokharan barges to assist; at present on the upper and central reaches of the Amoo Daria are about a hundred of such boats, capable of carrying about 40,000 poods.

The Amoo Daria serves as a means of communication roughly during the high-water season, which lasts three or four months only in the year. The water commences to rise in April, and the river is at its highest in August—this is the best time for traffic; the water falls from August to October.

In the event of the formation of such an auxiliary line of communications, by means of the Amoo Daria and the railway, it will be necessary to make an intermediate base at Chardjua, and also halting places between Chardjua and Kerki or Keliph, to be protected by small detachments.

The protection of the rear will demand a large outlay of troops, which must be left, not only in the enemy's territory, on the lines of communication of the Kabul column, but also in the Turkestan military district, and in Khiva and Bokhara. It is impossible to guarantee that the Emir of Bokhara and the Khan of Khiva, as also the administration and troops of these khanates, will be on our side in the event of war with Afghanistan.

At all events, all the Mahomedan population of central Asia will be in a nervously excited state of expectation. Strong though the link may appear between Russia and the Mahomedans of the above-mentioned territories, and also of our own immediate possessions, still we must always remember that in the Mahomedan world the traditions of the recent past are still too fresh, and also that there is all too much inflammable material to hand. In times of peace these forces, hostile to us, keep quiet, but in disturbed times they raise their heads, and on the scene appear the fanatical priesthood and the former rulers; and all this might cause us serious trouble. Hence, the presence of Russian forces in the rear must be a visible threat to these hostile elements.

It has already been pointed out that, when our forces march out of the Turkestan military district, for the protection of the latter there must be left 7 battalions of the Line, 2 batteries, and 9 sotnias, or, in round figures, 8,500 men. These forces must be divided up between Khiva, Bokhara, Samarkand, Tashkent, Khodjint, and Margelan; almost all these points lie along the Trans-Caspian Railway, and, consequently, we have the possibility of rapidly concentrating sufficient strength in any spot where circumstances may demand it. Again, in order to put down any disturbances in Bokhara, and also to safeguard the line of communications, besides the town of Bokhara, it will be imperative to occupy the following points:—

1. *Sharshauz*, being the centre of Shaar-Sabuz, which has a most restless and warlike population; also, if we command the water supply of Kizil-Su and the Kashka-Daria, it will be easy to keep control over the Karsha.
2. *Guzar* is important as the meeting point of the roads, and as a spot where it will be handy to form an intermediate base, where the supplies from the Guzar, Karshin, and Shaar-Cabuz districts may be forwarded to.
3. *Derbent* is the place where the roads from the Surkhan Valley to Guzar meet.
4. By the occupation of *Oorcha* we shall hold all the Hissar district.
5. *Shirabad* is a most important intermediate base, and the spot where the roads from the Hissar and Kuliab districts meet.

For the occupation of all the above-mentioned posts, and also for forwarding supplies, etc., it will be quite sufficient to allot 4 battalions, 3 sotnias, and 4 guns. Besides these measures, it will be useful to remove the Bokharan troops from their own country, and to utilise them as a working force, to improve and repair our lines of communications.

Also, to guarantee the safety of the line of communications in Afghan Turkestan, we can make use of material on the spot—the Usbegs, who form the greater part of the population, and who loathe the Afghans. By forming troops of them, with a stiffening of our troops, we may thereby considerably reduce the wastage of our troops; detachments of Usbegs and a lot of fortified posts, linking up the line of communications, will quite guarantee its safety.

Taking all this into consideration, we may limit ourselves to allotting for the lines of communications from Mazar-i-Sherif to Kabul in all only 5 battalions, 4 squadrons, and 6 guns.

Thus, for the guarding of the whole line of communications, not counting the troops left in the Turkestan military district and in the town of Bokhara, we shall need 9 battalions, 7 sotnias, and 18 guns, *i.e.*, about 10,500 men. Consequently, for actual service there remain 38,000 men.

However, the above-mentioned figure would have to be increased if the English threatened our communications from the valley of the River

Gilmend towards Gerdan-Divar. If, as we say, the enemy despatched 10,000 men to the valley of the Gilmend, we should have to increase the garrison in the Gerdan-Divar by, approximately, a brigade of rifles or of troops of the Line.

Lines of Communications.	Battalions.	Sotnias.	Guns.
Sharshauz	1	1	2
Guzar	½	¼	—
Derbent	¼	½	—
Oochi	¾	½	2
Shirabad	½	¼	—
For forwarding work	1	1	—
	4	3	4

Two guns of the battery left in Turkistan military district.

Lines of Communications.	Battalions.	Sotnias.	Guns.
Mazar-i-Sherif	1	1	2
Tash-Kurgan	¼	¼	—
Gei-Bag	¼	¼	—
Rui (base)	½	½	—
Bamyan	1	½	2
Garden-Divar	1	½	2
For forwarding purposes	1	1	—
	5	4	6
+	4	3	2
In all	9	7	8 Batt.

CHAPTER XV.

Operations Towards Chitral and Gilgit.

These operations, as we have already mentioned, have as their object the stirring up of the tribes inhabiting the Hindoo Koosh, in order to—with their assistance—bring pressure to bear on the line of communications of the English troops operating on the line Lahore-Peshawar-Kabul. This problem will be given *firstly* to the Chitral detachment, consisting of four battalions, two horse mountain batteries, and two sotnias of Cossacks, in all 5,000 men; and, *secondly*, to the Gilgit column (two battalions of the Line, one horse mountain battery, and one sotnia, in all 2,000 men). In order to maintain due touch in these operations, these columns must be under the command of the general commanding the Kabul column; and, again, the Gilgit column must be at the disposal of the commander of the Chitral one. Again, on the completion of the mobilisation of the troops in the Turkestan military district, in order to safeguard Bokhara and our territory from any aggressive movement on the part of the Afghan troops, the above-

mentioned columns must be moved out—the Chitral column towards the rivers Pendjeh and Kulyab, and the Gilgit column on to the Pamir towards the fortified post Shanjan.

It is most desirable that these columns, on their arriving in enemy's territory, should move off separately in front of the Kabul column, in order that, at the moment of the latter approaching the Hindoo Koosh, the results of the operations of the above-mentioned columns might speak for themselves. Therefore, as soon as war is declared and from the commencement of the movement of the Kabul column towards the Amoo Daria, the above-mentioned columns will start:—

a. The Chitral column from the Amoo Daria across Badakhshan towards the heights across the Hindoo Koosh and thence on Chitral.

b. The Gilgit column from the fort at Pendjeh across the Pamir and Hindoo Koosh-Gilgit.

It may be said against me that the isolated advance of the columns is risky, all the more so that every minor disaster which may befall us will be enlarged by the English into a great victory, which may act most unfavourably on our main operations. But, taking into consideration the fact that the Afghans will never decide to concentrate a large force in Badakhshan, thereby leaving the way to their capital open, we may calculate that the Chitral column will not encounter any serious opposition; it is even highly probable that, of the troops stationed in Badakhshan—*i.e.*, 4,500 men with eighteen guns—a considerable portion will be withdrawn to protect the capital. Having crossed the Hindoo Koosh, too, our forces will not meet very superior forces of the English.

Generally speaking, we must advise the commanders of the Chitral and Gilgit columns to use the greatest caution, not however to avoid decisive action, should circumstances demand this; but also, as far as possible, combined action in their operations.

The Chitral column will move from the Kulyab vilayet on to the crossings over the Piyandj River, and on *viâ* the towns of Faizabad and Zebak, the pass over the Hindoo Koosh on to the Chitral road, which forms the main trade artery between Bokhara, Badakhshan, and Chitral. The above-mentioned road crosses the Hindoo Koosh at many passes which are only open for three or four months in the year; amongst them are Khartitsa, Huksan, Agram, and Dora—from all of these roads lead to Chitral. The Huskan pass lies on the direct or shortest route from Faizabad to Chitral; Dora, the most westernly of the above-mentioned, is selected more frequently than the others on account of its being lower and not so steep.

The Gilgit column, for its movement across the Pamir to fort Shandjan and thence to the passes of the Hindoo Koosh, may use the eastern of the two roads across the Pamir leading from the valley of the Alai to the Hindoo Koosh, namely, *viâ* Kizil-arb pass, Lake B. Karakul, Ak-Baitell pass, and on and upwards along the Murgab-Akes, across the watershed of Chil-ob, *viâ* Bazai-Gumbez. The above-mentioned road is a good one for

baggage-animals, and, with a little working up, even for wheeled traffic. Along this road mountain batteries can get along all right on their gun carriages; further on it crosses the Hindoo Koosh, and moving along the valley the River Pukhsurovat flows up towards Gilgit. The most suitable passes are Jonov and Barogil; the first is open for transport animals from June to September, sometimes even till October, and is very convenient; it also lies in the shortest route to Gilgit. The Barogil pass, leading into the valley of Yarkund, is closed for baggage animals for four months, counting from December; the inhabitants of the Pamir think this a very handy pass, and traverse it on foot nearly the whole year round. But in order to get from the Barogil pass into the valley of the Yasin River one has to cross to the south the lofty snow-covered crest over the Darkot pass. The crossing of the passes over the Hindoo Koosh is not more difficult than crossing the ridges of the Pamir, but the valleys of the rivers along which one has to move to get to Gilgit are mere narrow gorges, in places without any tracks at all.

Let us halt a little to consider the strategic importance of Chitral and Gilgit. Being, as they are, the junctions of all the roads leading from the passes over the Hindoo Koosh, they are positions whence one can hold all the exits from the mountains. Let us refer to the words of E. Knight in his book, "Where Three Empires Meet." He says:—"The town of Chitral, being situated at the junction of several valleys, which lead to the passes, whence one may expect attack, commands them all, and opens a ready road to India from Bokhara *viâ* Badakhshan." Again, in another place he says:—"Gilgit is the most northerly advanced post of the Indian Empire, and covers all the passes in the Hindoo Koosh, from Shimshal, the most easterly, to the one lying on the upper waters of the River Yasin on the west. One glance at the map shows us that all these passes lead into the valley of the Gilgit River and its tributaries." Besides this, Gilgit is of importance as the junction whence start the mountain tracks into all the surrounding valleys, and such a position naturally helped it to be the centre towards which all the surrounding little States inclined. Thanks to this, it was much easier for the English to spread their rule on the one side towards the north-east, over Hunza and Nagar (Kundjut valley), and on the other towards the north-west and Chitral; and so again, once we have occupied Gilgit it will be easy to replace English rule by our own.

It is now important to explain about the relative importance of the above-mentioned posts, and, approximately, the forces with which the enemy will hold them.

Till 1895 Gilgit was the main point of concentration of the Anglo-Indian forces which were considered necessary for the beating off of our advance into Hindustan from the Fergan District, as Gilgit was independent. But in that year Chitral was occupied by the English, and has become, doubtless, the centre of the defence of the approaches to the northern frontier. The following may confirm this remark: the most convenient route for breaking into India from the north runs through Chitral, as by this route it is possible to get round the natural obstacles of the high and

inhospitable Pamir; and in addition to this, here is laid down an easy and much used caravan road, running straight from Chitral *viâ* Bandjur to Peshawar.

The outposts we are considering have great disadvantages in the situation of the roads, which unite them with English territory.

Gilgit has communication with English territory and with Srinagar by four roads:—

1. A very roundabout one up the rivers Indus and Dras, and then across the Dras Pass to Srinagar, the trade and administrative centre of the valley of Kashmir.
2. A straighter road, for beasts of burden, made under the superintendence of English engineers, and leading from Gilgit *viâ* the settlement of Bunjhi on the Indus into the valley of the Astor, across the Thibet Himalaya by the Darikun Pass, whence it drops into the valley of the Kinchinjunga, which falls into the Thelum, 300 versts from Srinagar.
3. The main and shortest road for beasts of burden from Gilgit across the Kinijut Pass, the Indus at Chilas, and across the mountains by a settlement; then into the Kunkhar valley, and thence to Abbotabad (350 versts). By this road the Indian Government can send reinforcements and stores to Gilgit without getting on to the Kashmir territory at all.
4. By the former roads from Gilgit to Bunja, thence down along the Indus and to Torbela.

Not paying any attention to the first road, which is very roundabout, there remain three routes, of which *the second* goes over heights, which is open only for six months, and for transport only for four months; *the third* route is closed half the year, and, as also *the fourth* route, runs through the territories of robber tribes, who in times of war would, in all probability, close all traffic along it (and the fourth road).

Chitral is united with Peshawar by a road which runs at first along the River Kunar, then across the mountains, by the Lahori Pass (10,450 feet) to the small town of Dir; hence working round amongst the mountains past the unapproachable valley of Penjkora, it goes to the village of Miankal, and thence, *viâ* Aladund and the Malakhand Pass to Peshawar or Nowshera (300 versts), which would be the basis of the English troops operating at Chitral. Provisions for a whole brigade can be procured from places closer than Nowshera or Peshawar; Swat and Bunjur could furnish everything needful. Then on this road is only one snowy range to cross, which is open six months for caravans; the rest of the year also it is *not* absolutely closed and impassable, for Umra Khan, with 3,000 men, crossed it in the depth of winter.

However, notwithstanding all the favourable conditions for Chitral's communicating with Indian territory, the position of the English troops at this place might be very dangerous. Along the above-mentioned road live tribes who have been independent for countless ages, who brook no outside

intervention, and whose one creed of faith is resistance to all foreigners. Some of these tribes offered resistance to the English during the last Chitral expedition, and were vanquished. The cantoning of English troops in their territory (Chitral to the Peshawar district) and the desire for revenge would doubtless make these tribes our allies; they would rise and cut off the English from their base, and, in a word, give them a world of trouble, as they can turn out a considerable armed force capable of showing serious resistance. According to the information possessed by the Indian Government, the main tribes in this locality could turn out:—Swat, 15,000 to 20,000 men; Bajour, upwards of 12,000; Ataman Khels, about 5,000; then the Bakus, Mahmunds, and other smaller tribes, several thousand. So that all the tribes *en masse* could, by English calculations, turn out a very imposing force. (All these tribes, taught by experience, are beginning to show some sparks of unison and of common aims and plan of action when fighting the English. We already see that for a conflict with the border tribes England has had to mobilise a force which numerically considerably exceeded what was necessary for her war with Afghanistan.)

In consequence of this, a considerable expenditure of troops will be necessary to safeguard the communications with Chitral. The English fully admit the danger to be expected from these tribes, which is clearly shown by the distribution of troops along the line from Chitral to the borders of the Peshawar district. The garrison in Chitral consists of two native regiments (we have no *data* as to the strength of these regiments; speaking generally, one can say that in India all regiments, except five, are of the one-battalion class; however, in war-time, two, three, or four of these regiment-battalions form compound regiments), two horse guns, and a company of sappers. The headquarters is at Darosh, 24 miles from Chitral, and here, in a very strongly fortified fort, is a half-battalion. On the Malakhand heights, as a support, and to guard the main road, is a native brigade of two regiments, a horse battery, and a company of sappers; one battalion has to guard the bridge over the Swat River. A body of 250 men from Swat, and 500 from Dir, have to guard the ground between the Swat River and Kila Drosh, a distance of about 100 miles (this distribution of troops was confirmed by the Secretary of State, 9th August, 1895).

So, taking into consideration all that has been said, it becomes clear that, if the English decide to oppose the Russians as soon as the latter emerge from the mountains, they will concentrate the main body of their northern front at Chitral, weakening considerably the Gilgit garrison, and carefully protecting their communications with Peshawar. To what has already been said we must add that to preserve touch between the two English advanced posts, Chitral and Gilgit, separated as they are by about 330 versts, will be extremely difficult—firstly, in consequence of the bad road between them, on which, also, the heights are only open in June (Indian Problems, No. 1: "Can Russia invade India?" by Colonel H. B. Hanna, 1895:—"Two well-worn paths connect these two posts; one of these goes over the Jui Pass, 14,812 feet, which is exceedingly difficult and almost impassable. The other, *viâ* Mastuj, the Shandur Pass

and Gakush, although straighter and slightly easier, is none the less a very bad route, and, in order to get baggage animals safely across it, one would have to send sappers and miners on ahead, and they would have a very tough job of it; and, secondly, owing to the absolute impossibility of getting any provisions the whole way." (Colonel Kelly's march is, indeed, a most heroic deed. He managed, with 200 native soldiers, 50 Kashmiris, and 4 mountain guns, to force a way over the Shandur heights. This the Chitralis themselves considered impossible.) Again, this road runs parallel to the boundary of the Hindoo Koosh, and is therefore open to a flank attack from the Hunza valley, Ashkiman, Yasin, and Mastuj. Having thus summed up the strategic value of Chitral and Gilgit, and having pointed out the weak points of their occupation by the English, we can easily sketch out the general lines for our troops' operations.

The Chitral column, after descending from the main ridges, will march on Chitral and at once clear it of the English; the trophy of this first victory will, in all probability, be the gaining of 40,000 allied warriors in the rear and on the flanks of the English. Here we must not show any indecision, as the latter, in the eyes of the wild mountaineers, goes for weakness; also, there will be no danger in this decisive action, as the English cannot tell off any considerable force for the defence of this their northern line of defence, *i.e.*, for the occupation of Chitral and Gilgit, and safeguarding the lines of communications with them; the utmost we may expect to meet under the walls of Chitral will be those troops who are there in times of peace (the Afghan troops holding Badakhshan will move off probably on to their own territory, *viâ* Ishkamish-Narin-Hinjan to Charikar); special circumstances alone could call for the strengthening of the troops guarding the communications of Chitral with Peshawar. After occupying Chitral, we must rebuild its fortifications, leave a garrison in it (to safeguard our base in Chitral, where provisions for nine months will be collected, and to look after the lines of communications, we might place along it a garrison of local levies), and, without wasting any time push on at once towards the south, besiege the Lawrie Pass and occupy Dir, which is one of the most important commercial centres in the country, and the meeting-place of the roads to Chitral, Swat, and Kunar. Here we can enter into immediate negotiations with the tribes inhabiting the whole district between Chitral, Kabul, and the Indus, and so arrange for an onslaught on the rear of the English troops, operating on the line Lahore-Peshawar-Kabul.

If the English troops concentrate towards Kabul to meet our column, it will be more advantageous for us to strengthen ourselves with bodies of the tribesmen under Russian officers, and move on Asmar, and from thence by the valley of the River Kunar along the magnificent road for wheeled traffic to Jelalabad. This road, besides being a convenient route towards the English rear, will open us, along the valley of the Bashgal River, a new means of communicating with Badakhshan. (This road has probably now been carried on from Asmar, along the valley of the River Bashgul to the village of Kamdesh, and so farther to the north, in the direction of Maudal and Dor passes. English officers, who were

in the Chitral valley in the autumn of 1895, saw parties of Afghan troops working along the lower reaches of the River Bashgul (Arnawai). Whilst the Chitral column marches to Jelalabad, columns of warriors from Swat and Buner, lead by our officers, might be thrown against Peshawar's line of communications with the rest of India, *i.e.*, the railway line attack, Rawal-Pindi. If we had better information about the road Jelalabad-Asmar-Birkot, and also about the Bashgul valley, then we might have had a chance of crossing the Hindoo Koosh by the Dor Pass, and moving by this road and occupying Asmar, which lies on the flank of the line of communications between the English in Chitral and Peshawar; ere, by entering into negotiations with the afore-mentioned tribes, and also with the people of Kafiristan, we might cut off the English line of retreat. By occupying Asmar, we shall place the English in Chitral in a *cul-de-sac*; so we shall have a chance of opening up intercourse with the tribes firstly, and then measuring our strength with the English. Our communications also with Badakhshan will be covered by the Hasund range 15,000 to 16,000 feet high, which divides Chitral from the Bashgul valley; we should only have to seize the heights of Shoui and Thuret (*Geographical Journal*, January, 1893), which lead into Kafiristan across lofty heights which flank Chitral from the west.

Let us now consider the operations of the Gilgit column. Having crossed the Hindoo Koosh by the Jonor Pass, and moved towards Gilgit, they must first make a reconnaissance of the place; they should only decide to attack the town if they are perfectly convinced that they can sweep away the enemy's opposition; should, however, the English have a numerical superiority, they must not risk fighting, but must select a position somewhere on the road from Gilgit to Chitral, or on the flank of the latter, so as not to give the English troops collected in Gilgit a chance of moving to the rear of our Chitral column.

It would also be useful at the same time by means of special agents to get into communication with the inhabitants of the Kunjut valley (they being very friendly disposed towards the Russians), hoping thereby to find and win in them allies, who could add 5,000 warriors to our ranks. Should, however, the enemy's forces at Gilgit be not large as compared with our forces advancing thither, and also if our troops are strengthened by the addition of the fighting men of the Kunjut valley, it will be possible to drive back the English towards the south of Gilgit. For their further advance the Gilgit column might move along the road across the Kinijut pass to Chilas, and thence, either along the valley of the Indus by Kugistan to Torbela, or across the mountains to the south of the village of Tak and along the Kunkhar valley, leading to Abbotabad. Kugistan has been but little explored; shut in by lofty mountains, traversable from the outer world by but few passes, which are open but for a few months in the year, the population has acquired a spirit of independence and a special character of its own, the tribes of Kugistan from ancient times have always been celebrated for their bold raids. Up to present times, in consequence of the hostility of the Shinaks and others, who inhabit the country between Bunji and English territory, they have had to put up

with circuitous routes as means of communication with Gilgit. Only when English troops occupied Chilas did it become possible to lay out the second of the roads to which we have already referred. As the Gilgit column in its further advance towards the south will have to enter the country of the Shinaks, we will attempt to give some idea of it.

The Shinak country includes Chilas, Darel, Tanjir, and other valleys. The form of government is republican; each Shinak valley is a small independent republic, and each village in each of these republics settles its own affairs. Thus, if any one of the villages in the kingdom does not agree with the others, it is at full liberty to carry out its own policy, and it sometimes happens that one of the villages enters into an alliance with some foreign kingdom, whilst the other villages of the same federation do the same, but with a kingdom hostile to the first. (See "Where Three Empires Meet," by E. F. Knight, 1893.) It is exceedingly probable that the presence in their country of the armed forces of England, so hateful to the freedom-loving tribes, and also our position as conquerors, will cause them to unite in our favour, and we shall find in them allies; but should the reverse be the case, we shall have to compel these tribes to serve our ends by means of force and policy. Circumstances will dictate which of the above-mentioned roads we shall have to use so as to attack the English line of communications. It would be better if, without meeting serious resistance from the tribes of Kugistan, we moved towards the south-west along the valley of the Indus, as this direction will bring the Gilgit column to the land of our probable allies; then forming here a "thunderbolt" of considerable strength, and moving on Rawul Pindi, we might make the English experience some very anxious minutes.

(*To be continued.*)

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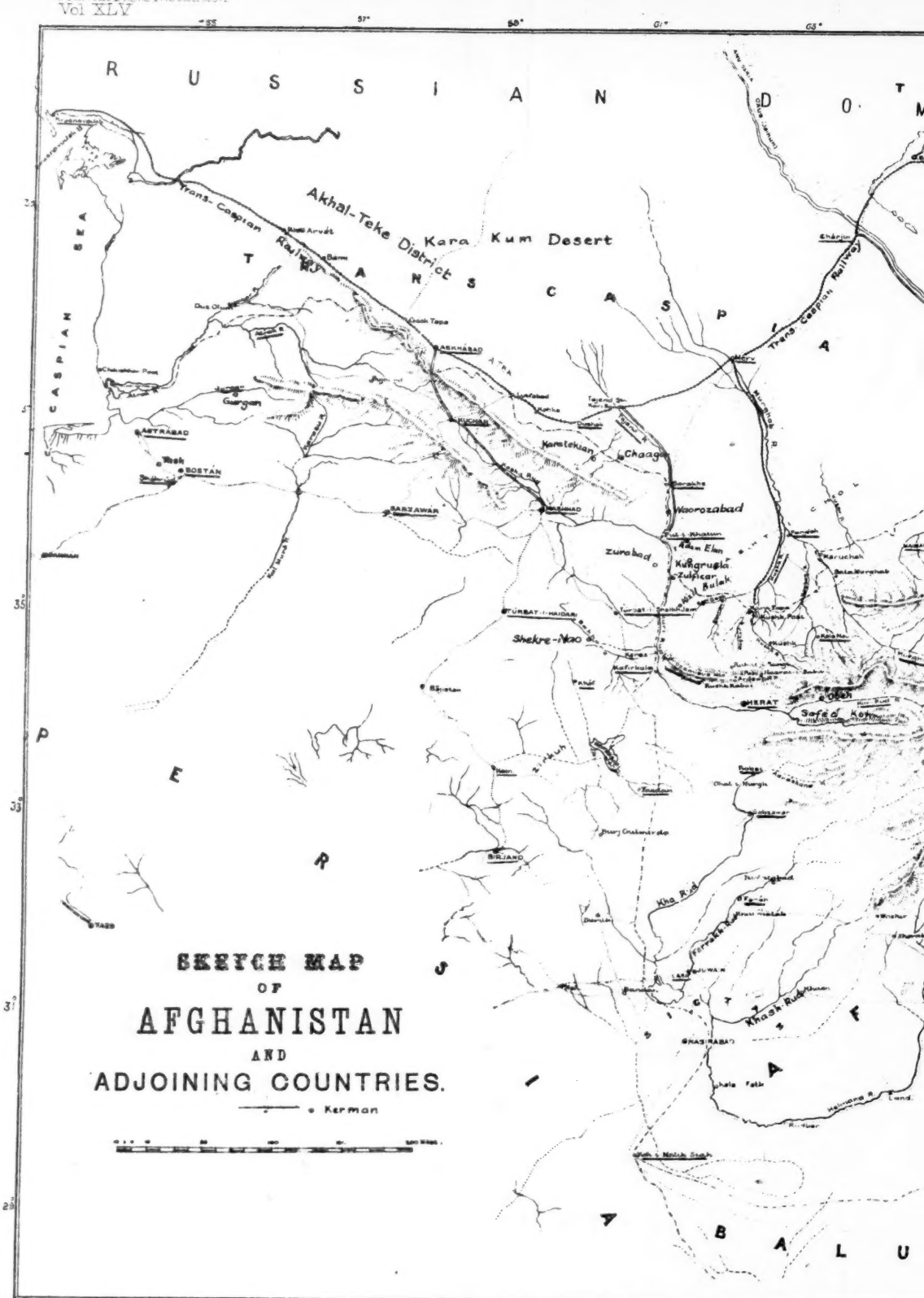

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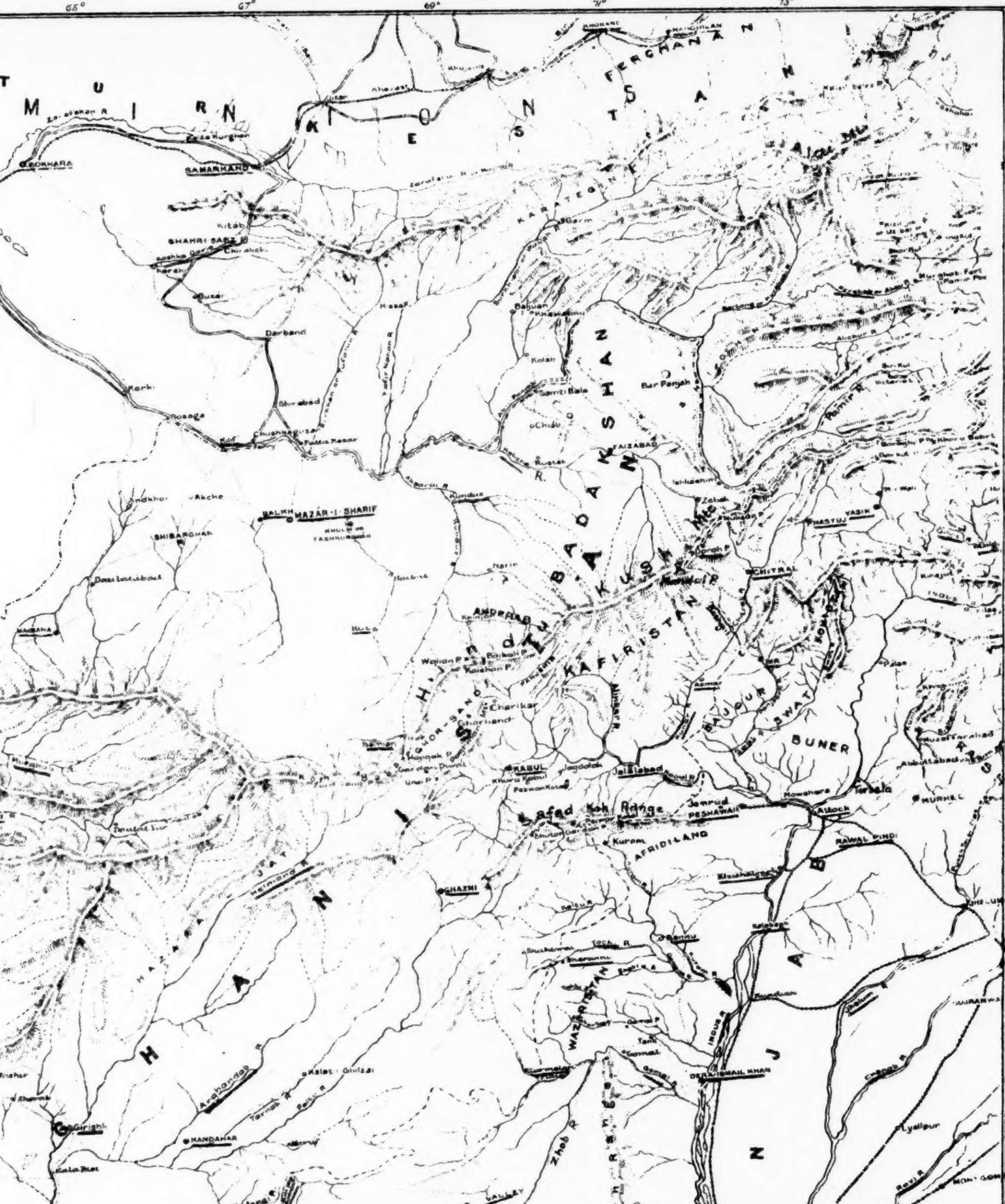

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SHAHRI SABZ
Kitab
Derband
Kerki
FERGHANA
KARATEGIN
Alai Mts
BADAKHSHAN
FAIZABAD
Hasar
Kolab
Rustak
Chitral
MASTUJ
YASIN
MAZAR-I-SHARIF
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Andkhoi
Akche
Narin
ANDERAB
KAFIRISTAN
Hindu Kush
Charikar
KABUL
Jalalabad
BAJOUR
SWAT
BUNER
Nowshera
Torbela
Attock
PESHAWAR
Jamrud
Safed Koh Range
AFRIDILAND
Kuram
RAWAL PINDI
MURREE
GHAZNI
WAZIRISTAN
Tochi R.
INDUS R.
DERA ISMAIL KHAN
Gomal R.
Zhob R.
SHOR VALLEY
Kelat-i-Ghilzai
KANDAHAR
Arghandab R.
Tarnak R.
Girishk
Chaman Fort
Kojak P.
QUETTA
Pishin
Darwaza
Harnai
Sibi
Dadar
Kelat
Nushki
MOOLTAN
DERA GHAZI KHAN
BHAWALPUR
Lyallpur
Ravi R.
Chenab R.
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SOUTH AFRICAN CAMPAIGN.

Précis of a Lecture delivered at Vienna by Captain R. TRIMMEL, late Austro-Hungarian Military Attaché with Lord Roberts' Army.

Translated from the "Reichswehr."

CAPTAIN ROBERT TRIMMEL, of the General Staff, delivered a lecture recently in the Vienna Military Science Institution, to a large military audience, giving his impressions and notes during the first phase of the South African campaign.

He was with the English Head-Quarters in South Africa as Austro-Hungarian Military Attaché, from the beginning of November, 1899, to the end of July, 1900, and was an eye-witness of the operations from the date of the arrival of Lord Roberts up to the capture of Pretoria.

Captain Trimmel first presented a characteristic portrait of the two contending parties. He next described the methods of fighting of the individual arms; and finally gave a general view of the methods adopted by the English for keeping the Army supplied with men and *matériel*. According to the lecturer's personal observation, the English soldier has all the characteristics of the "mercenary." He follows his officer blindly, and absolutely carries out his duty, but without ambition. His own individual character first shows itself when fighting begins. Calm as he always is, he even then does not show rashness. It is when he is really hotly engaged, that he begins to exhibit his complete self-possession. But, at all times, when it is a question of intelligence, the English soldier is far inferior to the Boer. A high type of manliness and practical common sense must be allowed to the English officers. Their *moral* was conspicuous, particularly in the days of defeat. At such times criticism was less audible amongst them than in the days of success.

Captain Trimmel was able to make notes on the results of the English battle-training of the several arms from personal observation only after Lord Roberts assumed command, as permission to be present at the actual scene of fighting at the commencement of the war was not accorded to him any more than to the other Military Attachés while General Buller was in command. At the opening of the war the English fought chiefly in loose formations, and their reserves, too, followed in open order. At that time their artillery endeavoured to over-master the enemy's in a real spirit of self-sacrifice. It only began to be recognised in the later battles, after many failures, that fire superiority could never be attained by the infantry, as it was impossible to get a sight of the

enemy. How little effect the English artillery fire produced in many cases may be gathered from the fact that whole batteries were often engaged for hours with a single Boer gun without succeeding in silencing it or even sensibly improving the conditions for the infantry advance. The peculiar configuration of the ground, by adding to the difficulty of fixing localities, introduced fresh complications. For instance, on the day of the fight at Waterfall Drift, the lecturer and the American Attaché were both reported "missing." As a matter of fact, they had gone out from the English left flank, and, having arrived between the contending lines, were unable to see anything of either the English or the Boers. It was only by noticing the fall of the bullets that they discovered where they really were.

The lecturer next touched on the several forms of projectiles used and their effect. Shrapnel was generally ineffective, chiefly owing to the difficulty of estimating the range and getting corrections, as it was impossible ever to see one of the enemy's guns (except at night, when the flash could be observed), and also on account of the height of the burst, as the bullets, on the bursting of the shrapnel 260 to 330 feet above the ground—an ordinary occurrence—only had the effect of small pebbles. At Paardeberg, for instance (immediately before Cronje's capitulation), 5,000 Boers were actively engaged for hours in face of the concentrated fire of 100 English guns, and yet after the capture of the enemy's position only 150 wounded Boers could be counted. The naval guns proved themselves of far greater value, thanks to their larger calibre. The lyddite shells obtained good results against fixed objects, but had but little effect against troops in open order. The expectation of the deadly shock to be caused by the explosion of these shells was not realised. Artillery fire was generally opened by the naval guns at ranges between 9,000 and 11,000 paces, and was succeeded by the field guns at 4,000 paces, and maintained at that range.

The lecturer next explained, in very interesting fashion, the doings of French's Division after the relief of Kimberley, and gave many examples to show that the actual fighting was carried out by the mounted infantry. In connection with this point, Captain Trimmel drew comparisons between the cavalry and the mounted infantry. The cavalry went into action with the firm conviction that they must fight it out with sword or lance, and in fact tried over and over again to get at the Boers with these weapons, but they seldom succeeded in doing so. Then the cavalry of themselves adopted mounted infantry tactics.

In reconnaissance, the cavalry were able to effect but little, owing to the wide extent of the field of operations; indeed, they were barely able to carry out screening duties in the tactical sense, and gradually found themselves obliged to adopt dismounted action; and finally to put themselves on exactly the same footing as the mounted infantry, as far as fighting tactics were concerned. The mounted infantry were not trained nor organised for independent action, till after the war had commenced, and Lord Roberts had taken over command. And it is only of late that we see them formed in larger tactical bodies;—as brigades, composed of

several battalions turned into independent operating forces, by the addition of artillery and technical troops. The service of supply was intimately connected with the assistance that could be afforded by the railways, and the rapidity with which these could be repaired—seriously damaged as they were—while the army advanced. The English technical troops deserve the greatest credit in this connection. The medical service, provided with military *personnel* for one army corps, and augmented by civilian *personnel* to cope with the needs of the whole army, demanded the utmost exertions from every one of its members.

The climatic extremes of the country, and the want of tents, must not be overlooked in connection with the long marches that were carried out. Even the English Head-Quarter Staff generally bivouacked in the open, and the Military Attachés were only able to get some shelter from the frequent rain at nights after the surrender of Paardeberg, when a few tents and shelters became available for distribution.

THE ORANGE FREE STATE ARTILLERY.

By CARL VON HEISTER.

Translated from the "Militär-Wochenblatt" of 29th December, 1900.

I LIMIT myself to giving some details not generally known concerning the Orange Free State Artillery to which I, as Major Albrecht's adjutant, belonged to the time of his being taken prisoner. Anyone who has read the English reports of the battles will come to the conclusion that the Orange Free State had at its disposal a numerous and, even in peace, a thoroughly trained artillery. Nothing could be more erroneous. In the beginning of the campaign it was only by calling in reserves and the purchase of horses that 3 batteries of 4 guns each could be raised. These 3 batteries, apart from 2 reserve guns, formed the whole artillery. Major Albrecht was responsible for the whole organisation of this arm in the Free State. At the request of the Free State Government, made to Germany in 1880, Major Albrecht, who was at that time Lance-Sergeant-Major in the 2nd Guards Field Artillery Regiment, was sent to Africa. At the beginning of the war there were 14 Krupp field guns at his disposal. With regard to the statement made in the English papers that the Boer artillery was commanded by "European skilled artillerymen," I will state exactly how it stood at the beginning of the war. As mentioned above, the artillery consisted of 3 batteries, which were distributed in the following manner: (i.) A battery under Major Albrecht in the western theatre of war—Kimberley; (ii.) a battery under Lieutenant Schmidt at Bethulie; (iii.) a battery in the eastern theatre of war to Natal. We see that the want of officers compelled Major Albrecht, the commander and organiser of the whole artillery, to take command of a battery, and he was prevented from exercising his influence in the conduct of the campaign; had he been at headquarters it is not likely that the month of October would have passed as it did, and Lord Methuen would probably have had his march stopped on the Hex (Hese) River, close by Worcester, instead of on the Modder River. The commanders of the other 2 batteries, both born Free Staters, had already drilled a battery in peace-time; they, however, had not an opportunity of exercising their powers as battery commanders, as the small number of guns necessitated a splitting up of the units, and at the most 2 guns could be spared for a single command, while with these 2 batteries the other officers' posts were filled by sergeants. In Major Albrecht's battery there was a

German named Sturkenburg as officer and section leader, but he had become a Free State burgher; he originally had one year's service in the No. 19 Field Artillery Regiment. The second section leader was a very useful sergeant, a Free Stater. The third was a Dane named Andersen, formerly a lieutenant in the reserve Danish infantry. He was taken prisoner with General Prinsloo and was referred to by Lord Roberts in his despatch as "Danish officer in the States Artillery." As gun commander Albrecht had one other German named Eikhof. Like Sturkenburg, he had lived long in the Free State and had become a burgher. He also had been one year in the German Field Artillery. Our battery included also a Herr Angusstein, watchmaker, from Bloemfontein, who served his year in the 109th Grenadier Regiment. Besides these, I also was a German, but not a gunner; from 1888 to 1895 I was a lieutenant in the 19th Oldenburg Dragoon Regiment; I went to the Staff College, but was obliged to leave on account of lung disease, and was sent to South Africa in June, 1899. That is the list of the "foreigners" in the Free State Artillery, and of these only Andersen, Angusstein, and myself, came under that head, as the remainder were Free State burghers. Of the remainder, officers and men were born Free Staters.

To my knowledge similar conditions existed in the Transvaal Artillery. Some foreign officers may have joined during the course of the war (I have heard of two former Artillery officers), but N.C.O.'s and men were, without exception, Boers.

The *matériel* was a 7·5-centimetre Krupp field gun. It was superior to the Transvaal, where they had guns of different patterns rendering the ammunition supply more difficult. The gun was somewhat out of date, it was not a Q.F. gun, nor had it smokeless powder.

The Boers were splendid material, and with proper training would be behind no European soldiers. The horses were likewise excellent; Major Albrecht purchased them himself, the average price being from £12 to £13. Although not so thoroughly and systematically trained as with us in Germany, I never observed any difficulty in manœuvring even on unfavourable ground. The question of great manœuvring capacity did not arise in the battles of Belmont and Bloemfontein. We always had time to prepare a position and strengthen it with entrenchments and emplacements. Without these it is probable not a man of us would have been left, since, for example, at Graspan three guns had to meet about as many batteries, and at Modder River five guns had at least four batteries to fight. As to the horses they did great work with very little food. The forage consisted chiefly of maize and chaff, we seldom got oats. Very often there was no forage at all; in that case they were unsaddled and bridled and knee-haltered and turned out to graze. As we were often a long time in the same place the grazing ground soon became bare, but even with this wretched feeding the horses remained fit for work.

NAVAL NOTES.

HOME.—The following are the principal appointments which have been made: Vice-Admiral—H.R.H. Prince Henry of Prussia, Vice-Admiral in the Imperial German Navy, to be Honorary Vice-Admiral in His Majesty's Fleet. Rear-Admiral—A. W. Moore, C.B., C.M.G., to be Commander-in-Chief on the Cape station. Captains—A. H. Limpus to "Gibraltar"; W. H. B. Graham to "Algiers"; J. Durnford, C.B., D.S.O., to "President" for service at the Admiralty; A. W. Paget, C.M.G., to "Endymion"; C. J. Baker to "Astræa"; A. Barrow to "Excellent"; A. M. Farquhar to "Diana"; C. Windham to "Isis"; H. C. B. Hulbert to "Arrogant"; A. W. Prothero to "Royal Oak"; H. E. Cust to "Rambler"; T. P. Walker to "Royal Arthur"; A. A. C. Galloway to "Tribune"; F. S. Pelham to "Cambrian," and then to "Flora" R. L. Groome to "Cambrian"; C. H. Coke to "Terpsichore." Commanders—Hon. F. C. Addington to "Phœbe"; H. S. Grant to "Surprise"; F. C. Wentworth to "Vesuvius"; G. H. Mundy to "Barham"; C. L. Napier to "Cleopatra"; R. B. Colmore to "Black Prince"; J. R. Bridson to "Ganges"; R. H. Anstruther to "Cockatrice"; C. E. Anson to "Osborne."

Disposition of the Fleet for Her late Majesty's Funeral.—The following ships were assembled at Spithead and moored in the order shown in the accompanying plan, on the occasion of the removal of the remains of Her late Majesty from Cowes to Portsmouth on Friday, the 1st inst:—

First-class battle-ships—"Majestic" (flag-ship of Vice-Admiral Sir H. Rawson, Commanding Channel Squadron), "Prince George," "Mars," "Hannibal," "Jupiter," "Resolution," "Hood," "Trafalgar," "Nile," "Sans Pareil."

Second-class battle-ships—"Alexandra" (flag-ship of Rear-Admiral Sir G. Noel, Commanding Reserve Squadron), "Rodney," "Camperdown," "Benbow," "Collingwood," "Colossus," "Howe," "Edinburgh."

Third-class battle-ships—"Conqueror," "Hero."

First-class cruisers—"Niobe," "Galatea."

Second-class cruisers—"Minerva," "Arrogant," "Diana," "Melampus," "Severn."

Third-class cruisers—"Pelorus," "Pactolus," "Bellona."

First-class torpedo gun-boats—"Antelope," "Gleaner," "Skipjack," "Leda," "Alarm," "Rattlesnake," "Circe," "Speedwell."

Foreign countries were represented as follows:—

Germany.

Third-class battle-ship—"Baden" (flag-ship of Vice-Admiral H.R.H. Prince Henry of Prussia).

Fourth-class battle-ship—"Hagen."

Second-class cruiser—"Victoria Louise."

Third-class cruiser—"Nymphe."

France.

First-class armoured cruiser—"Dupuy de Lôme."

Japan.

First-class battle-ship—"Hatsuse."

Spain.

First-class armoured cruiser—"Imperator Carlos V."

Portugal.

Second-class cruiser—"Don Carlos."

The coffin was conveyed in the "Alberta," with Admiral Sir M. Culme-Seymour, Bart., G.C.B., Principal Naval Aide-de-Camp, and four of the Naval A.D.C.'s in attendance, which was followed by the "Victoria and Albert," flying the Royal Standard of England and the Imperial Standard of Germany side by side at the main,

POSITION OF THE FLEET AT SPITHEAD ON THE OCCASION OF THE FUNERAL OF HER MOST GRACIOUS MAJESTY QUEEN VICTORIA 1ST FEBY 1901.

and conveying T.M. the King, Queen, and German Emperor, with other Royal personages; then came the "Osborne," the Kaiser's yacht "Hohenzollern," and the Admiralty yacht "Enchantress," conveying their Lordships.

The Royal flotilla left Cowes a little before 3 p.m., headed by a flotilla of torpedo-boat destroyers, consisting of the "Petrel," "Crane," "Kestrel," "Sylvia," "Spiteful," "Electra," "Fawn," and "Vulture," which took station, three on each bow of the "Alberta," and proceeded at a speed of about 6 knots past the ships between the two lines, the fleet firing minute guns in succession as the yacht passed, with the ships manned and bands playing, until the yachts passed into the harbour, where they arrived about 5 p.m., the "Alberta" being moored for the night alongside the Victualling Yard, and the "Victoria and Albert" and "Hohenzollern" going to buoys.

Rear-Admiral A. W. Moore, C.B., C.M.G., succeeds Rear-Admiral Sir R. Harris, K.C.B., K.C.M.G., as Commander-in-Chief of the Cape station, and he will hoist his flag on board the first-class cruiser "Gibraltar"; he is succeeded at the Admiralty as Junior Sea Lord by Captain J. Durnford, C.B., D.S.O., who consequently vacates the appointment of Captain of the Dockyard Reserve at Chatham, to which he was only quite recently appointed, Captain W. H. Graham taking his place. The first-class battle-ship "Ocean" has been ordered from the Mediterranean to strengthen the fleet in China, and the first-class battle-ship "Hood," which was commissioned last December as port guard-ship at Pembroke, is to be detached temporarily to take her place in the Mediterranean, none of the new battle-ships being as yet ready for sea. The first-class cruiser "Blenheim" commissioned at Chatham on the 2nd ult. for China and left Portsmouth on the 15th for her station. The first-class cruiser "Blake" arrived at Plymouth on the 2nd ult. with the relieved crew of the "Empress of India" from Malta; the "Blake" will take out a new crew for the first-class cruiser "Royal Arthur," which will be recommissioned at Sydney for a further term as flag-ship on the Australian station. The second-class cruiser "Diana" commissioned at Chatham on the 15th ult. to relieve the "Venus," a sister-ship in the Mediterranean. The second-class cruiser "Leander," from the Pacific, paid off at Chatham on the 15th ult.

Wreck of H.M.S. "Sybille."—His Majesty's second-class cruiser "Sybille," a vessel of 3,400 tons, 9,000-I.H.P., a speed of 19 knots and carrying 8 guns, one of the ships built under the Hamilton Naval Defence Act of 1889, was wrecked on the morning of the 16th ult., in Lambert's Bay, to the north of Saldanha, during a heavy gale. The ship had been sent to Lambert's Bay to co-operate with the land forces in the operations against the Boer invaders. The *Cape Times* states, from official information, that on the night of 15th January the "Sybille" was lying at anchor in Lambert's Bay, and was compelled by stress of weather to put out to sea. Captain Williams and about fifty of the crew were ashore at the time, Lambert's Bay being utilised as a military base, and the presence of the detachment on shore being necessitated by this circumstance. At 10 o'clock at night the "Sybille" steamed out of the bay, which, by the way, affords virtually no protection to shipping, and is an exceedingly bad anchorage. The cruiser safely reached the open sea, and about 2 o'clock in the morning, the weather moderating somewhat, the vessel was put about, and proceeded to steam back to the bay. The night was dark and the weather thick, and the southerly set of the current had carried the ship some three miles to the southward. Presumably this circumstance was unknown to those in charge of the ship, for the doomed vessel came on and struck heavily on an ugly reef to the southward of the bay, where she remained hard and fast, all efforts to back her off proving fruitless. Shortly after the vessel had struck, H.M.S. "Tartar" and the "City of Cambridge," transport, arrived on the scene on their way south. A furious sea was then washing over the stranded cruiser, and the crew had taken refuge in the rigging and on the fore-bridge. In the meantime, Captain Williams had come off to the wreck in a tug from Lambert's Bay, and with the greatest difficulty he eventually succeeded in getting an endless rope line on board the "Sybille," by means of which the whole of the crew were eventually taken off. Throughout the trying work of saving the lives of the ship's company discipline was admirably preserved on board, and the behaviour of one and all was in accordance with the highest traditions of the Royal Navy. The ship struck at 4.30 in the morning, and

the whole of the ship's company had not been got off the wreck until 2 o'clock in the afternoon. The only life lost was that of W. H. Jones, a young ordinary seaman, 19 years of age, who was swept across the deck by a heavy sea and crushed to death against a 4·7-inch gun. On the news of the disaster reaching the naval headquarters at Simon's Town, Rear-Admiral Sir R. H. Harris and his staff at once left for the scene of the wreck. The "Doris" got under way at 4 o'clock on the morning of 17th January and arrived off the coast where the "Sybille" stranded on the same afternoon. After standing in so as to enable the Admiral to view the "Sybille" and her position from the sea, the flag-ship steamed into Lambert's Bay. On the following day the Admiral drove round to the point where the cruiser was lying, and, it is understood, arrived at the conclusion that it was impossible to do anything to save the ship, which by this time had been carried by the force of the sea from 200 to 300 yards further in shore along the reef. The under part of the ship was consequently torn to pieces on the rocks, the lower portion being completely awash, and the water inside the hull rising and falling with the tide. She was lying broadside on to the shore almost on an even keel. All hopes of saving the ship were abandoned, and efforts were to be made to save the guns. The newspaper remarks on the exceptional nature of the weather at the time of the disaster, observing, "Under ordinary circumstances we should have little hesitation in venturing to predict fine weather at this time of the year, but the extraordinary violence of the recent gales and floods has puzzled the most experienced students of Cape weather."

Steam Trials.—The first of a series of trials to test the relative endurance and cost of cylindrical and Belleville boilers ended at Portsmouth last month on the return of the second-class cruiser "Minerva," Captain C. H. Cochran. She was required to steam for 30 hours at 2,000-I.H.P., but at the end of the 25th hour the Parliamentary Committee on Boilers were satisfied with the results and the ship made for Portsmouth. The mean speed during the trial was 12 knots, which was produced with 2,133-I.H.P., and the coal and water consumption respectively was 2·15 and 19·04 lbs. per unit of power per hour. The "Minerva," which is fitted with cylindrical boilers, at the close of the trial went into harbour to have her tubes cleaned before going on her next run.

The new first-class battle-ship "Implacable" has completed the first of her steam trials. The trial was at one-fifth of her full power and extended over 30 hours. On this run the vessel attained most satisfactory results, the means of which were :—Steam in boilers, 220 lbs. ; vacuum, 28 inches ; revolutions, 66 ; I.H.P., 3,265 ; speed, 11·10 knots. The "Implacable" was to have continued her trials, but on starting for the 30 hours' run at four-fifths H.P., some defects developed themselves, which necessitated the trials being stopped, until repairs could be effected.

Change in Uniform.—Notice has recently been given in the *Gazette* that, in pursuance of His Majesty's pleasure, the following changes are to be made in the uniform of flag officers, as regards the collar and cuff of the full-dress coat :—Collar.—Instead of gold lace, oakleaf pattern embroidery in gold on white cloth ; piping at top as before. Collar to be 2 inches high instead of 2¼ inches, with corners slightly rounded. Cuffs.—Instead of the gold band, oakleaf embroidery, 2¼ inches round the cuffs, with rows of ⅝-inch distinction lace round the sleeve above the cuff, according to rank—viz., Admiral of the Fleet four rows, Admiral three rows, Vice-Admiral two rows, Rear-Admiral and Commodore first-class one row—the upper row to form a circle 2 inches in diameter, in the centre of the upper sleeve. The embroidered cuff is to have ¼-inch piping above the embroidery. The lower row of distinction lace is to be placed ¼ inch above the top edge of the piping. Five years will be allowed before the alterations become compulsory.

The New Vickers-Maxim Guns.—It is satisfactory both to the Ordnance Department and to the country to know that by an altered shape given to the du Bangé pad, which closes the breech of the new long high-velocity guns for the most modern ships, there is no appreciable diminution in the life of the gun, and no escape of gas, even after prolonged firing. The system may be considered as satisfactory as any that can be obtained, until some powder or propellant is discovered that brings less strain, with equal velocity. There is, however, every probability that such a discovery may shortly pass the experimental stage.

Naval Expenditure and Mercantile Marine.—The following Return, showing Aggregate Naval Expenditure on Seagoing force; Aggregate Revenue; Aggregate Tonnage of Mercantile Marine; Annual Clearances of Shipping in the Foreign Trade; Annual Clearances of Shipping in the Coasting Trade; Annual Value of Imports by Sea, including Bullion and Specie; and Annual Value of Exports by Sea, including Bullion and Specie, of various Countries, exclusive of China and South American Republics, but including British Self-governing Colonies, for the Year 1898, has been presented to Parliament.

NOTE.—Except where otherwise stated the figures refer to 1898. Where it has not been possible to give the particulars for 1898 the figures for the latest year available have been shown.

Countries.	Aggregate Naval Expenditure on Seagoing Force.	Aggregate Revenue.	Aggregate Tonnage of Mercantile Marine.	Annual Clearances of Shipping in the Foreign Trade.	Annual Clearances of Shipping in the Coasting Trade.	Annual Value of Imports by Sea, including Bullion and Specie.	Annual Value of Exports by Sea, including Bullion and Specie.
BRITISH EMPIRE	£	£	Tons.	Tons.	Tons.	£	£
United Kingdom	22,547,844 (a) (1897-98)	108,336,000 (Year ended 31st March, 1899)	9,001,860 (b)	45,838,622	54,462,061	528,779,342	346,227,689
India	313,293 (c) (d) (1897-98)	61,682,698 (Year ended 31st March, 1898)	46,903 (e)	3,866,889 (Year ended 31st March, 1898)	12,184,632 (Year ended 31st March, 1898)	60,243,043 (Year ended 31st March, 1898)	67,016,455 (Year ended 31st March, 1898)
SELF-GOVERNING COLONIES (p)							
Australasian (r)							
New South Wales... ...	47,215 (1897-98)	9,482,096 (Year ended 30th June, 1898)	121,279	3,455,061	No Returns	18,775,359	23,526,333
Victoria ...	60,134 (f) (1897-98)	6,875,459 (Year ended 30th June, 1898)	101,682	2,482,992	613,286	14,673,806	12,491,910
South Australia (except Northern Territory)	16,831 (1897-98)	2,612,730	50,986	1,760,167	No Returns	4,436,870	5,990,741
Northern Territory		67,116 (Year ended 30th June, 1898)	443	92,441	No Returns	113,960	182,596
Western Australia ...	4,021 (1897-98)	2,604,943	11,350	1,189,732	No Returns	5,241,965	4,900,006
Tasmania ...	5,000 (1897-98)	908,223	15,154	542,119 (1897)	No Returns	1,650,018	1,803,369
New Zealand ...	20,814 (1897-98)	5,072,026 (Year ended 31st March, 1898)	90,995	765,793	5,901,434	8,230,600	10,517,985
Queensland ...	26,721 (1897-98)	3,768,152 (Year ended 30th June, 1898)	23,018	596,313	3,527,266 (g)	5,588,552	9,780,136
Africa—							
Natal	—	1,964,315 (Year ended 30th June, 1898)	3,195	1,262,231	No Returns	5,369,672 (h)	1,263,354
Cape of Good Hope	—	6,402,519 (Year ended 30th June, 1898)	2,191	2,789,989	3,927,311	16,679,834 (l)	25,318,701
America—							
Dominion of Canada ...	—	8,382,750 (Year ended 30th June, 1898)	672,220	6,219,683 (m) (Year ended 30th June 1898)	14,162,880 (m) (Year ended 30th June 1898)	28,833,504 (n) (Year ended 30th June 1898)	33,730,003 (Year ended 30th June 1898)
Newfoundland	—	316,730 (Year ended 30th June, 1898)	109,174	337,148 (Year ended 30th June 1897)	No Returns	1,066,205 (Year ended 30th June 1898)	1,074,027 (Year ended 30th June 1898)

REMARKS.

(a) Of this total £21,837,416 was ordinary expenditure, and £710,428 was expenditure under the Naval Works Act, 1897 (outside Navy Votes).

(b) Including the Isle of Man and Channel Islands.

(c) Expenditure in India converted into sterling at the official rate for the year of 1s. 2¼d. the rupee.

(d) Includes a contribution of £100,000 for Her Majesty's ships in Indian Waters, and £59,600 for Her Majesty's ships and vessels for the Naval Defence of India. The balance represents expenditure on the Marine Department.

(e) In addition to the vessels registered under the Imperial Act of 1894, India owns some vessels of small tonnage registered under the Indian Act X. of 1841: these are not included in the table.

(f) Exclusive of expenditure on naval buildings and vessels which is included in a sum of £6,620 expended for defence works and buildings, and is not separately distinguished.

(g) Inclusive of the tonnage of vessels (2,674,131 tons) engaged in coasting voyages terminating beyond the Colony.

(h) Including the value of goods imported in transit for the interior.

(k) Including the value of gold, the produce of South African States, brought into the Colony overland, and exported by sea.

(l) Including the value of goods entered for removal to places outside the Customs Union.

(m) Exclusive of the tonnage of vessels (6,208,926 tons) trading on the rivers and lakes between Canada and the United States.

(n) Total Imports and total Exports. Imports and Exports by sea are not separately shown in the Canadian returns.

(p) The revenues of these Colonies are exclusive of loans raised.

(r) Includes contributions towards the maintenance of Her Majesty's vessels for protection of floating trade in Australasian Waters, as follows, for 1897-98 :—

New South Wales	£37,820	New Zealand...	£20,814
Victoria	33,743	Queensland	13,762
South Australia	10,499		
Western Australia	4,021	Total	£125,500
Tasmania	4,841		

The annual contribution is £126,000, payable in advance. It was apportioned amongst the various Colonies on a population basis for the year commencing 1st April 1899, as follows :—

New South Wales	£37,886	New Zealand	£20,924
Victoria	33,083	Queensland	14,030
South Australia	10,355		
Western Australia	4,732	Total	£126,000
Tasmania	4,990		

NOTE.—The above particulars with regard to naval expenditure have been furnished by the Admiralty. The remaining particulars have been extracted either from Board of Trade returns or from the official returns of the various Colonies.

Countries.	Aggregate Naval Expenditure on Seagoing Force.	Aggregate Revenue.	Aggregate Tonnage of Mercantile Marine.	Annual Clearances of Shipping in the Foreign Trade.	Annual Clearances of Shipping in the Coasting Trade	Annual Value of Imports by Sea, including Bullion and Specie.	Annual Value of Exports by Sea, including Bullion and Specie.
	£	£	Tons.	Tons.	Tons.	£	£
Russian Empire	6,705,000	147,245,000 (1897)	605,804 (1897)	8,739,208 (a) (1897)	18,427,512 (a) (1897)	31,910,000 (b) (c) (1897)	49,060,000 (b) (c) (1897)
Germany ...	6,083,874 (1898-99)	70,644,000 (Year ended 31st March, 1899)	1,555,371 (1897)	12,943,572 (1897)	3,683,056 (1897)	287,249,000 (d)	215,562,000 (d)
						Metric Tons.	Metric Tons.
Netherlands ...	1,282,206	10,159,000	296,081 (1897)	8,630,822	—	11,445,000 (e)	2,385,000 (e)
						£	£
France	11,988,718	139,552,000	900,288	17,001,608	6,908,913 (1897)	174,626,000	139,369,000
Portugal ...	787,112	11,951,000	77,835	8,981,434	1,298,024 (f)	14,798,000 (d)	10,835,000 (d)
Spain	1,007,621 (1898-99)	34,633,000 (1898-99)	657,924 (1897)	13,533,212	11,420,018 (1897)	23,341,000	30,883,000
Italy	4,248,545	68,208,000 (Year ended 30th June, 1898)	786,644 (1897)	18,635,415 (i)	11,108,319 (i)	45,088,000	28,405,000
Austria-Hung'y	1,206,772	Austria. 60,342,000 Hungary. 43,875,000	Austria. 168,038 (1897) Hungary. 57,037	Austria. 11,703,977 (1897) Hungary. 1,848,588 (1897)		13,369,000 (b)	9,568,000 (b)
United States (year ended 30th June)	9,725,742 (p) (1898-99)	102,986,000	737,709 (g)	21,891,738 (h)	—	148,319,000	255,042,000
Japan	3,867,466 (1898-99)	21,085,000 (k) (1897-98)	318,394 (l) (1897)	3,365,332 (1897)	3,723,614 (1897)	32,379,000 (m) (1897)	19,847,000 (m) (1897)

REMARKS.

NOTE.—The *actual* naval expenditure for any year is seldom known—never immediately—the figures given, therefore, are the sums voted.

With regard to the revenue and commerce of foreign countries, in converting the foreign currencies into £'s sterling the par value of the foreign money has been taken, except in the case of Japan, where the yen has been taken at its average exchange value in 1897, viz., 2s. 0½d.

(a) The figures refer to Russia-in-Europe, and the Caucasian ports of the Black Sea.

(b) Special Trade, *i.e.*, Imports for Home Consumption or Exports of Domestic Produce or Manufacture, as the case may be.

(c) Trade by European sea-board, including also Finland.

(d) Total Trade. Imports and Exports by Sea are not separately distinguished.

(e) The particulars as to *value* of trade by sea are not available.

(f) Portuguese vessels only.

(g) Registered for over-sea (*i.e.*, Foreign) Trade only.

(h) Exclusive of the tonnage of vessels (3,856,494 tons) engaged in the Lake trade between the United States and Canada.

(i) Certain vessels formerly included in the Coasting trade are now classed under the head of "Liners" and included in Foreign trade.

(k) Includes the Chinese Idemnity.

(l) The tonnage of Japanese vessels is that of vessels of foreign type, excluding Junks.

(m) Including Formosa.

(p) This sum was the original estimate for the year 1898-99, but on account of the war the appropriations amounted to £22,705,901.

NOTE.—The above particulars with regard to naval expenditure have been furnished by the Admiralty. The remaining particulars have been extracted from the Official Returns of the various Countries mentioned, except in the case of Spain and Portugal, for which certain figures have been extracted from the "Almanach de Gotha."

FRANCE.—The following are the principal promotions and appointments which have been made: Vice-Admirals—E. Humann, F. E. Fournier, to be Members of the Superior Council of the Navy; C. F. Marquis de Courthille to be Commander-in-Chief of the 2nd Arrondissement Maritime (Brest). Rear-Admirals—E. A. Maréchal, G. A. Roustan to be Vice-Admirals: P. A. Servan to command of Atlantic Division. Capitaines de Vaisseau—J. E. Merleaux-Ponty, H. A. Jauréguiberry, J. M. Puech, A. Fiéron to be Rear-Admirals: Richard d'Abnour to "Magenta." Capitaines de Frégate—J. L. Girard la Barlerie to "Casabianca," and to command of *Défense Mobile* at Tunis: E. M. Lemoigne to "Achéron": H. E. Campion of "Vinhlong": A. V. Adam to "Salve," and for command of the *Défense Mobile* at Brest: L. R. C. M. Dartige du Fournet to "D'Entrecasteaux": H. G. Bûchard to command Naval Flotilla at Diego-Suarez: M. Serpette de Bersancourt to "Du Chayla": C. E. Favereau to "Lévrier": A. M. Poidloue to "Salve": M. P. Landry, R. V. Winter, and P. Moritz to Capitaines de Vaisseau.—*Journal Officiel de la République Francaise.*

Vice-Admiral the Marquis de Courthille took over the command at Brest on the 24th ult. in succession to Vice-Admiral Barréra. Rear-Admiral Courrejolles, who recently returned from China in his flag-ship, the "D'Entrecasteaux," and had temporarily hoisted his flag on board the transport "Bien Hoa" at Toulon (the "D'Entrecasteaux" had been placed immediately in dockyard hands for repairs), hauled his flag down on 31st January. Rear-Admiral Bayle, who succeeds Rear-Admiral Courrejolles in China, will hoist his flag on board the first-class cruiser "D'Entrecasteaux" at Toulon, when the necessary repairs now in hand are completed: he has selected as his flag-captain, Capitaine de Frégate Dartige du Fournet, who is to be promoted very shortly to Capitaine du Vaisseau, when he will be the youngest officer of his rank on the list, being only forty-four. Rear-Admiral Servan, who succeeds Rear-Admiral Richard in command of the Atlantic Division, will hoist his flag on board the first-class protected cruiser "Tage," which ship will take the place of a somewhat similar ship, the "Cécille," as flag-ship. Rear-Admiral Merleaux-Ponty, recently promoted, has been appointed to relieve Rear-Admiral Servan in the naval command of Algeria. Rear-Admiral Ponty, as captain, has for the last three years been employed in organising

the arsenal of Sidi-Abdallah at Bizerta, and to him is due the credit for the rapidity with which the works have been carried on, and to enable him to continue this duty it has been arranged that he will reside at Bizerta instead of Algiers, where Rear-Admiral Servan will be replaced by a capitaine de vaisseau.

The first-class cruiser "D'Entrecasteaux" arrived at Toulon on the 9th ult. from China: she has landed her two 24-centimetre (9·4-inch) guns, which have been sent to the Government Factory at Ruelle to have new breech mechanism fitted, orders having been given to proceed as rapidly as possible with the repairs; it was considered wiser to order the ship home in preference to leaving her on the station, in presence of so many foreign war-ships, useless for fighting purposes, while her heavy guns were disabled.

It is interesting to note that the second-class battle-ship "Redoutable," which was detached last autumn to strengthen the French Squadron in China and to serve as flag-ship for Vice-Admiral Pottier, maintained an average speed of 11·5 knots all the way out, with 48 revolutions of her screw; this is an excellent record, as the "Redoutable" is an old ship, launched in 1876, is only single-screwed, with a displacement of 9,000 tons, and engines developing 6,570-I.H.P.; she underwent a thorough repair a few years ago, receiving Belleville boilers in place of her old cylindrical ones, which has given an increase of nearly three-quarters of a knot, her full speed being now 15·4.

It may be remembered that last summer the Mediterranean and Channel Squadrons were combined in the Channel under the command of Vice-Admiral Gervais, and were exercised together for a month. The result was considered so satisfactory that the experiment will be repeated again this year, but the Channel Squadron will this time proceed to the Mediterranean for the purpose. It is further reported that the Commander-in-Chief this year will be Vice-Admiral Humann, who will hoist his flag at Brest on board the new first-class battle-ship "Iéna"; the junction of the two squadrons will take place after the Straits have been passed. The combined fleet will manœuvre together for a month, when the Northern Squadron will return to the Channel.

The new third-class cruiser "Infernet" will commission on 1st March next for Madagascar, where she will relieve the second-class cruiser "Nielly," an old wooden ship, quite obsolete. On 3rd January, in a thick fog, the torpedo-cruiser "Fleurus," one of the Northern Squadron, was run into in Brest roads by the tug "Menhir," a large hole being made on the port bow; the crew quickly got the Makarof collision mats over the hole, and the "Fleurus" was brought safely into harbour and placed in dock. She is a vessel of 1,306 tons and 18 knots speed, and was launched in 1893. In proceeding from Brest to Cherbourg on her way to the Solent, to represent France at the funeral of Her late Most Gracious Majesty, the first-class cruiser "Dupuy de Lôme" experienced very bad weather and had one of her boats washed away. It is stated that all the ships of the Mediterranean Squadron are to be fitted with Marconi's wireless telegraphic apparatus.

Trial of Submarine-Vessels.—M. de Lanessan, Minister of Marine, and General André, Minister of War, visited Cherbourg on 6th January to witness comparative trials between the submarine-vessels "Morse" and "Narval" with a view to determining the relative merits of the two systems for guidance in the construction of the new submarine-vessels provided in the programme for 1901. The Ministers were conducted at once to the quay, where are situated the conductors which charge the accumulators used in the submarine-boats. The crews of the two vessels were there drawn up for inspection and were seen to be seamen wearing the ordinary uniform with the addition of a red cap-ribbon bearing the words *Sous-Marins*.

The "Morse" is a submarine-boat proper. The "Narval" is a boat of the sub-mergible type, which, under ordinary circumstances, navigates on the surface as a torpedo-boat, but can be submerged, becoming then a submarine-boat: in the first case the motive force is a petroleum engine, in the second electricity supplied from accumulators.

The "Morse" has a displacement of 146 tons, and is cylindrical in shape, with a length of 36 metres (118 feet) and diameter of 2·70 metres (8 feet 3 inches). The forward end is fitted with a torpedo discharging-tube, and at the after end is the propeller. From the tube to the motor extends a long passage, having at the sides two rows of accumulators superimposed. In the centre, under the captain's conning-tower, which is reached by an iron ladder, are all the levers and handles for working the machinery which moves the boat both in a vertical and horizontal direction. Above are two manholes, one communicating outside with a narrow platform of lattice work raised about 30 centimetres (11 inches) above the hull of the vessel, and under which the water is free to pass. The other with the conning-tower, which itself has also a manhole communicating with the outer air besides three small glass scuttles, all of which can be hermetically closed from the inside. Under the horizontal deck, which extends almost from end to end, are ballast tanks, which can be filled at will with water when it is desired to submerge the vessel. From the conning-tower the captain directs the vessel when navigating on the surface. When submerged she is guided by means of the periscope, an instrument which projects above the water when the boat is submerged to any depth up to 6 metres (19·6 feet). This ingenious device reflects everything within its field of vision, and can be turned round so as to cover the whole horizon.

When the Minister of War had embarked on board the "Morse," orders were given to get under way, and she proceeded from the dockyard basin out into the harbour, a considerable sea was running outside, sufficient to make the steam-launch which followed behind, and in which the Minister of Marine had taken his seat, pitch and roll considerably, the "Morse," however, was wonderfully steady, rolling very slightly only. After crossing the harbour, she steered towards the "Imprenable" hulk, which serves as a workshop and quarters for those engaged in adjusting torpedoes, here she awaited orders to submerge, which were soon after given. The ballast tanks then commenced to fill, and in a few moments the voices of the men in charge were heard reporting "forward tanks full," "after tanks full," "midship tanks full," the manholes were then closed and the "Morse" commenced to sink, the water rose, first over the scuttles, and finally over the conning-tower, allowing only a bluish light to filter through the glass; the whole operation of submerging does not take more than two minutes to complete, and all that can then be seen of the "Morse" above the surface is the periscope, which having a diameter of only 10-centimetres (3·9 inches), is quite invisible at a short distance.

The feeling experienced at the moment the vessel is making her descent is most peculiar, it is one of expectancy but nothing happens, one is astonished at the quiet, the absolute calm, there is no movement, not even a tremble, the waves wash overhead without causing the least vibration, the motor works silently and the vessel glides through the water without causing any bow wave or leaving any track. Alone the voice of the captain is heard, who, standing by the periscope, gives his orders for so many degrees of helm and so many revolutions of the engine; the little vessel is now almost in equilibrium and would sink deeper or rise to the surface were it not for the "ailettes" on each side which serve to prevent this; before an instrument which indicates the depth stands a petty officer with his eye fixed and his attention concentrated on the pointer, and by turning a wheel he causes the "ailettes" to act so as to maintain the vessel at the required depth. Should she for any reason continue to descend or refuse to ascend a pig of lead ballast can be detached, which would cause her immediately to rise to the surface, but after this the buoyancy would be so much increased that she could no longer be submerged even with all the ballast tanks full. Orders had been given to remain a quarter-of-an-hour under water, and at the expiration of the time, pumps are set in motion and the water was forced out of the ballast tank and the "Morse" commenced to rise, the conning-tower and the small platform emerge, and the man-holes are opened; no commotion takes place at the entry of the external air, and no inconvenience has been felt by those on board during the dive, the act of breathing being as free and regular as in the open air. Trials to ascertain the habitability of the "Morse"

had already been made, and she has remained for eight hours under water, the crew experiencing no difficulty in breathing and no buzzing sensation in the ears, no excitation or inconvenience of any sort, and it was considered they could have remained double the time if necessary, the chemical analysis of the air showing also that it would have been possible to considerably prolong the trial if required.

The Minister of War after disembarking from the "Morse" joined the Minister of Marine on board the "Imprenable," and the next trial was with the "Narval." As has already been stated, the "Narval" is a submergible torpedo-boat. On the surface she acts like an ordinary torpedo-boat, the engines being worked by steam, when submerged she becomes a submarine-boat, and the motive force is electricity. She has a displacement of 106 tons and is not cylindrical in shape like the "Morse," her upper works, being flat, form a deck, and the conning-tower, funnel and periscope project above this, giving her at a distance a novel and peculiar appearance. The submerging of the "Narval" is a rather delicate operation, the motive power has to be changed, the funnel, etc., have to be drawn in, sufficient time must be allowed for the unused steam to cool down, and a much greater quantity of water than in the case of the "Morse" has to be introduced into the ballast tanks to overcome her buoyancy. Great progress has been made in these respects since her first trials, and the operation of submerging has been much accelerated, but it still takes considerably longer than in the case of the "Morse." On the present occasion submergence was effected in a quarter of an hour, and when submerged the only thing visible above the water is the periscope. The trials were suspended at 11.30 a.m., and the Ministers then proceeded to the prefecture for *déjeuner*; in the afternoon they again went on board the "Imprenable" to witness torpedo practice from the submarine-boats.

The "Morse" has three firing positions, the bow-tube with air impulse, and two special carriers on the side, each holding one torpedo, which, when fired, are simply detached and proceed with their own motive force, all three can fire only in the axis of the vessel. Four shots were fired, and in each case the torpedo ran straight and true. The "Narval" has four discharging positions on a system invented by M. Drzewiecki, which allow of the torpedo being fired in any direction, four shots were also fired, but with not quite such satisfactory results as from the "Morse," but the day was drawing to a close, and the light was bad. The Ministers expressed themselves well satisfied with what they had seen, and returned to Paris in the evening.

France has now four submarine-boats completed, namely, the "Gymnote," "Gustave-Zédé," "Morse," and "Narval," and ten building, namely, two "Morse," four "Narval," and four "Farfadet." The submarine-vessel "Français," one of the two building by private subscription, was floated at Cherbourg on 29th January. She is similar to the "Morse," 36 metres (118 feet) long; beam, 2·75 metres (8 feet 5 inches); and 146 tons, the motive force being electricity.—*Le Yacht* and *Le Temps*.

Précis of M. Lockroy's "Lettres sur la Marine Allemande" continued and concluded. Translated from the *Temps*:—

No. V.

At Holtenau is the entrance to the celebrated North Sea Canal, which puts the Fjord of Riel in direct communication with the North Sea, an immense work, undertaken both for strategical and commercial reasons. It is of great assistance to the coasting trade, and at the same time enables the two fleets to proceed rapidly from east to west or from west to east, either to concentrate against an enemy, or attack him in detail, should he appear on both sides at once; a black marble tablet at the entrance announces that the canal has been completed under the auspices of Wilhelm II. The locks, more than 100 metres long, are magnificent works; beyond these the canal continues between green hills and a country dotted with trees of a park-like appearance. In ten hours the fleet can pass through from one end to the other; immense coal stores allow of vessels replenishing without having to go to Kiel for the purpose. While the battle-ships

are engaged coaling, the torpedo-boats pass through the canal, and in turn complete with coal at the other end; thus no time is lost.

Though the importance of Kiel has much increased since the opening of the canal, Wilhelmshaven, on the North Sea, is undoubtedly Germany's chief military port. Unfortunately it is tidal, and this defect prevents the fleet moving out at low water. Powerful locks hold the water up to a sufficient level. The roadstead does not appear to be a good anchorage, as ships seldom lie there for any length of time. There are two entrances, the old and the new, about a kilometre apart. The former, on account of its small dimensions, is now little used. Between them has been constructed a small port of refuge for merchant-vessels, which is available also for torpedo-boats. The dry docks at Wilhelmshaven are now too small for modern ships, and the port, which was purchased from the Duke of Oldenburg for a mere song, is an artificial creation, requiring constant attention and outlay. A new basin, more than 200 metres long, is just completed, and a similar one is in course of excavation, but nothing will quite make up for the natural faults of the position. In winter the sea freezes between the locks, and the ice is so thick that the ice-breaking steamers generally used in West Germany are not always able to break it. The outlet to the sea being also on the west, and the cold wind blowing always from the east, the ice is forced into the locks, where it accumulates sometimes to a dangerous extent. In view of these objections, Prince Bismarck wished to give up Wilhelmshaven and create another port on the Weser, near Geestemünde. Unfortunately 100,000,000 marks had already been spent on Wilhelmshaven, and, fearing opposition, the project was adjourned. Notwithstanding its poor situation, Wilhelmshaven, with the works in progress for its improvement, will become a formidable arsenal. A canal, 4 metres deep, connects with the basins and allows of torpedo-boats proceeding to Emden, on the Netherlands frontier, where a torpedo-boat station has been organised.

At the time of my visit to Wilhelmshaven the fleet was in the dockyard. I should not be able to say much about the ships composing it that is not well known already. Naval construction in Germany has made such progress that her battle-ships and cruisers bear comparison with the best in Europe. The tonnage of the former does not exceed 12,000 tons, they are, however, as heavily armed as those proposed in France of 15,000 tons, the armament consisting of four 28- or 30-centimetre (11- or 12-inch) guns in pairs in turrets forward and aft and eighteen 15-centimetre (6-inch) guns. German vessels are always built in series of four similar ships, the divisions of a fleet also number four vessels, continually in the German Navy one meets with this cypher four or multiples of four.

Another matter of note is that the admiral in command of a fleet hoists his flag on a special vessel independent of the two divisions of which it is composed; besides affording him one battle-ship more, it gives him also the power to proceed to any point where his presence is most required without interfering with the organisation of the fleet. Our admirals who embark in one of the battle-ships incorporated with the fleet appear to have less freedom of action.

The cost of the new German fleet including the works to be completed in the ports and dockyards will amount to about 2,326,000,000 francs (£93,040,000). In explaining to Parliament the necessity for so large an increase in the fleet, Rear-Admiral Tirpitz said that "the geographical position of Germany, the absence of coaling bases, and the consequent necessity for replenishing at sea, make a large battle-fleet necessary, the North Sea and Baltic coasts are so much enclosed that a war against commerce only, advantageous as it may be to other nations, is not possible for us even if our cruisers succeeded in making the open ocean; they would be unable to return with their prizes; and where could they obtain coal? The fleet of a Power like Germany can never be the same as that of France for instance, whose coast-line forms a projecting angle into the ocean."

The different divisions of the fleet are distinguished by coloured cylinders, white, red, yellow, and blue, which the vessels hoist at their mast-heads; their

number in the division is indicated by iron bands round the funnels of a corresponding colour.

The German fleet like that of all other nations is divided into an active and a reserve fleet. The ships in reserve are arranged in groups of four, one of which only is manned, the crew being composed in great measure of officers and men with special qualifications. In peace-time this crew visits in turn the other vessels of the group, keeping them in order, and from time to time taking them out for trials, when everything is tested to ensure its being in working order. When the order to mobilise goes forth, the crew is divided equally among the four ships, forming a nucleus of officers and men who know every detail and around which the reservists can group themselves.

Serving in one or other of the two maritime districts the reservists know beforehand their destination in case of war, and, as far as possible, are always attached to the same ship, so that when in the haste of mobilisation they embark, they have themselves a clear notion of their duties and what is expected of them. There are no crowds of men arriving at the dockyards uncertain what to do or where to go, told off at the last moment to their ships, or sent from port to port in answer to some sudden call ; all is regulated and set down beforehand, both in a general sense and in detail ; on arrival at the railway station the reservists find an officer on the platform, who takes their names, consults the lists, and sends them off direct to their duties ; and, thanks to this perfection of system, in a short space of time all the maritime forces of the Empire are ready for war ; two or three days are allowed for ships of the first reserve and ten hours for the torpedo-boats.

Discipline on board is severe, corporal punishment not having been abolished, but important guarantees are given to accused persons, a civil judiciary being charged with the proceedings for prosecution and for defence ; quite recently also civil members have been introduced to sit on courts-martial, the courts being composed of five members—three civil and two naval. Courts-martial are open to the public in all cases, except those against discipline, it not being considered necessary in Germany that the country should know that any soldier or sailor has for a moment forgotten the respect which he owes to his superiors.

The flat coast around Wilhelmshaven bristles with formidable batteries, the defence of which, like those round Kiel and at Heligoland and four other German ports, has been taken from the Army and confided to the Navy, the batteries being all manned by naval gunners under naval officers ; if this is not the case at Danzig and a few Prussian ports, it is that these ports being considered of only secondary importance, the change was not thought necessary. As usual, in Germany, common-sense reasons are responsible for these views, which are not in accordance with those of most nations.

A fight between a battery and a ship is after all only a form of naval warfare, and it has, therefore, been thought wise to place naval men in the batteries ; they alone can distinguish at a distance between an enemy and a friendly ship. What military officer has a sufficiently practised eye to distinguish at a distance a German from a French or a Russian from an English ship, or to understand the vessel's manœuvres and divine her object ? Naval officers alone are apt for this duty, and can discover and profit by the weak points of an attacking fleet. It is, moreover, necessary that an intimate connection should exist between the coast batteries and such engines of defence as submarine mines, torpedo-boats, and coast-defence vessels, as efficient combinations of these different elements can only be obtained when they are all worked by the Navy and under the sole direction of a naval officer. These were von Moltke's views, and in this, it will be remembered, he was in agreement with Gambetta ; unfortunately for us, though Moltke succeeded in convincing Germany, Gambetta did not succeed in convincing France.

No. VI.

The small town of Elbing is, so to speak, the creation of the Schichau firm, by which it lives and for which it exists ; the works are now under the direction of

Herr Zieze, son-in-law and successor of Schichau. Well known throughout the world, the firm builds torpedo-boats for Russia, Italy, Austria, Sweden, Brazil, Japan, and China. Though the chief works are at Elbing there are also large establishments at Danzig, more than 6,000 workmen being employed, and in addition to building torpedo-boats and larger war-ships locomotives are constructed, which latter appear to be a *sine quâ non* with all ship-building firms in Germany. I was taken over the works by Herr Busley, one of the foremost naval architects in Germany, and was invited to be present at the launch of the Russian cruiser "Novik" at Danzig.

The torpedo-boats built by the firm are unlike those constructed either in England or France, and it must be said they convey the impression of strength together with great speed and manœuvring powers; officers of our Navy who had seen some of them in Crete, had previously spoken to me of them with admiration. Their powers of endurance cannot be disputed, they have constantly made the passage to China, even during the monsoon, without developing any defects. Numbers of them are to be seen at Elbing, on the stocks, in the basins, in the river, in fact everywhere, either in course of construction or under repair; others are ready packed for transport, in pieces, in large cases; these are destined for Japan—the Japanese like to put their boats together themselves, they would feel humiliated were they sent to them ready-made as to China.

The most interesting types are those recently constructed for the Russian, German, and Italian Navies. They give rise to great discussion and a good deal of controversy, some prefer one type and some the other; the difference between them is considerable, though all are considered most excellent in design; it seemed to me that the Russian boats were the best, and this, I understand, is also the opinion of their constructor. They are, in reality, heavily armed destroyers.

The German boats have a displacement of 365 tons, a length of 61 metres (200 feet), beam of 7 metres (23 feet), and three Thornycroft boilers modified by Schichau. They carry 95 tons of coal, and have a speed of 26 knots, and a straight stem; they are armed with three 5-centimetre guns (1·9-inch) and three torpedo-tubes, and carry also under ordinary circumstances a deck cargo of 5 tons of coal. The Italian boats are smaller, and everything has been sacrificed to speed. Their displacement is 280 tons; length, 60 metres (196 feet), and beam, 6 metres (19 feet), four Schichau boilers, and they carry 75 tons of coal. The first built, the "Lampo," attained a speed of 32 knots on trial, the contract speed having been 30 knots; they are armed with one 7-centimetre (2·7-inch), and five 4-centimetre (1·5-inch) guns and two torpedo-tubes, and have a ram-shaped bow. The dimensions of the Russian boats are:—Displacement, 350 tons; length, 61 metres (200 feet); beam, 7 metres (23 feet); four Schichau boilers, 95 tons of coal, and speed 29 knots; they are armed with one 7-centimetre (2·7-inch) and four 5-centimetre (1·9-inch) guns, and three torpedo-tubes, and have a ram-shaped bow.

The German Navy attaches great importance to its torpedo flotilla. Small boats have been definitely given up in favour of boats of 350 tons able to keep the sea; each division is composed of four boats with one in reserve in addition. Elbing may be considered more the industrial centre; Danzig is the arsenal, it guards the eastern frontier, and has gained in official importance since the Franco-Russian Alliance, and considerable works and extensions are planned, probably with the intention of increasing the naval force stationed there, which at present consists of a division of armoured gun-boats afloat and a division of torpedo-boats hauled up. Two things noticeable in the dockyard at Danzig are the torpedo-boat shed and the repairing and building slips for large vessels, particularly the ingenious arrangement of these latter.

The Vistula at this point is narrow, and does not admit of the launching of a vessel in the ordinary way, or of warping vessels of 6,000 tons (the limit which can

ascend the river) into dry dock. To get over this natural defect, the vessel is first placed in a floating dock, which is then towed into a basin, the bottom of which is an inclined plane on which rails are laid, the dock or cradle is allowed to ground on this, and then by immense chains and powerful hydraulic machinery cradle and ship are drawn up the inclined plane and moved off to one or other of the repairing slips. The operation takes an hour and a half, and in this way four vessels can be under repair at the same time, one on the right-hand slip, another on the left, one in the centre, and the fourth on the inclined plane itself. The vessels are floated again by the same means, and when a ship is built in the yard she is launched (if it may be so called) in a similar manner.

The torpedo flotilla of the mobile defence is sheltered in an immense shed under lock and key, and consists of six vessels, kept in the most perfect order and symmetrically arranged, the engines are constantly turned, and every three years (only) crews come from Kiel and take the boats out for a short sea cruise.

The storehouses, hulks, and depôts of all sorts are disposed along the bank of the river towards its mouth. When the fleet visits Danzig the big battle-ships remain outside and replenish from lighters, the cruisers come into the river, and the torpedo-boats go into the basin, and the operation of revictualling is carried on expeditiously, notwithstanding the number of merchant-vessels always at anchor, and the enormous quantities of floating timber near the river banks. The Vistula makes several sharp bends near its mouth and then proceeds straight for the sea ; on the right is a thick forest dotted with military works, and on the left the free port. Stored along its quays are to be seen large canvas targets representing battle-ships, cruisers, and torpedo-boats which are towed out to sea and used by the fleet for heavy gun target practice. Seen at a distance these targets have a most realistic appearance.

Near the mouth of the river lie the four armoured gun-boats of the defence. A young capitaine de corvette, who with us would at most be a lieutenant of 10 or 11 years' standing, commands this division. The youth of the German officers is a most remarkable thing. They become admirals at about the age that our officers with luck become capitaines de vaisseau. This is due in great measure to the system of retirement, which permits officers who are worked out or who see no prospect of advancement to leave the Service. This would not suffice, however, were it not that severe selection also thins out the ranks. Any officer, who for one reason or another is no longer considered efficient, receives at the end of the year, no matter what may be his position, a short letter, somewhat as follows :—"Sir, His Majesty the Emperor has no further need of your services," and the recipient retires at once into private life. By this severe weeding of the lists only the best and most efficient officers remain, which allows of promotion being made by strict seniority and without favouritism, thus those bitternesses and jealousies so common among sailors are avoided. One more thing is, however, necessary to the officer for success. No one either in the German Army or Navy is promoted to a higher rank without the approval of his comrades. Before each promotion a vote is taken from those of the corresponding rank, and should the "noes" be in the majority, the officer at once sends in his resignation and quits the Service. Consequently only those remain who know each other, and are bound together with ties of mutual esteem. I should have liked to say more on this subject of the officers, but it would be entering too much into detail, and in the course of these letters I have attempted only to draw attention to the chief characteristics of the German Navy, its methods, its organisation, its power, and the thorough way in which it is prepared for war. While there are many things in which I think we can learn from Germany, I must add that in no country can be found a *personnel* of officers and men superior to our own or possessing in a higher degree the sentiment of discipline, sense of duty, and love of the flag. The behaviour of the commander of the "Iltis" when

he called to his men, "Before we sink, let us cry 'Long live the Emperor,' was heroic, but not more so than that of the commander of the "Framée," who when urged to leave his sinking ship replied to those who wished to save him, "Tout à l'heure."

RUSSIA.—The following are the principal promotions and appointments which have been made: Vice-Admirals—Hiltebrandt, Senior flag-officer in command of the Black Sea Fleet Division; Andreev, to command of 1st Division of the Black Sea Fleet; Dubasov President of Naval Technical Committee. Rear-Admirals—Veselii and Kasherininov, as Junior flag-officers of Black Sea Fleet. Captains—Nevinski to 3rd Fleet Equipage and battle-ship "Piotr Velikie"; Nicolas I. to 14th Fleet Equipage and battle-ship "Oryol"; Miklukh to coast-defence ironclad "Nie Tron Menia"; Sukhotin to first-class cruiser "Aurora."

Reviewing the naval year in Russia we find that the following ships were launched, viz.:—First-class battle-ships "Pobieda," "Kniaz Potemkin Tavricheski," and "Retvizan"; First-class cruiser "Aurora," third-class cruiser "Novik," and destroyers "Kit," "Skat," "Kasatka," and "Delphine," and the "Som" built in England. There were laid down and are progressing well at St. Petersburg three first-class battle-ships, the "Borodino," "Oryol," and "Imperator Alexander III.," while there are being proceeded with at the same place the first-class battle-ship "Kniaz Suvorov" and coast-defence ironclad "Admiral Butakov." The second-class cruiser "Variag" and torpedo depôt-ships "Yenisei" and "Amur" are almost completed, and have been tried and will go into commission this spring. The first-class battle-ships "Poltava" and "Sevastopol," and first-class armoured-cruiser "Gromoboi" were fully completed and despatched on foreign service last autumn, while the protected cruisers "Diana" and "Pallada" are receiving their final equipment. Six sea-going torpedo-vessels were built at home, and in France three, the "Osiotr," "Kefal," and "Losos." The first-class battle-ships "Peresviet" and "Osliabia" are nearly completed, while good progress is being made with the first-class battle-ship "Tsesarevich," the second-class protected cruisers "Askold," and "Bogatyr," the first-class armoured cruiser "Bayan," and the third-class cruiser "Boyarin" (at Copenhagen). The Russians boast that they not only have achieved successes in the original designing of ships and the working out and preparation of all the details and the numerous engines, but are now totally independent of the West, so that if all communications with Europe were cut off everything could be made in their country, to the smallest bolt, of their own materials and with their own appliances. They admit, however, that private shipbuilding, and especially that of the mercantile marine, is still in the bud.

New Ships.—The following are some particulars as to the first-class battle-ship "Tsesarevich" which is to be launched at Toulon, her place of building, next month. In dimensions, fighting equipment, and speed she will be one of the most noteworthy units of the Russian fighting fleet. Her dimensions are:—Length at water-line, 388 feet 9 inches; extreme beam, 76 feet 1 inch; draught at stern, 26 feet; displacement, 13,000 tons; I.H.P., 16,300; estimated speed, 18 knots. Her armament will consist of four 12-inch guns in pairs in turrets, twelve 6-inch Q.F. guns in pairs in turrets, twenty 76-millimetre Q.F. guns, sixteen of them in the battery and four on turntables, twenty 47-millimetre Q.F. guns, eight of them being placed in the tops, six 37-millimetre in the tops, two Baranovski guns for landing purposes, four Maxims, four 47-millimetre and two 37-millimetre guns for boats. The torpedo gear consists of two under-water tubes and two above-water. There are two torpedo launches, each 56 feet long.

It is proposed to build a despatch-vessel of 3,500 tons displacement at the Baltic Works. She is to have Belleville boilers without economisers, and triple-expansion engines on the compound system. Her profile resembles that of the Imperial yacht "Standart."

The following are some details with regard to the third-class cruiser "Boyarin." Her displacement is 3,200 tons; extreme length, 345 feet; beam

amidships, 41 feet; draught, 16 feet; and depth of hull, 26 feet, so that her upper deck is 10 feet above the level of the sea. She is of the class of protected cruisers, her armoured deck consisting of two layers of a total thickness of $1\frac{1}{2}$ inches, increasing to 2 inches amidships along the curves of the deck. Her transversal section is not a curve but a broken line as regards her armoured deck, and round the water-line cofferdams are placed, the armoured deck protecting all the vital parts. The timbers are made with brackets, which in this case are formed of quadrangular pieces of steel, suited to the dimensions of the ship, instead of the usual joist, to which even resistance is given by making oval incisions or else using four separate pieces of three-cornered steel. It is believed that much less steel is thus used. The vessel has been ordered of the firm of Burmeister and Vejns, of Copenhagen. It has been a very moot point whether this plan of ordering was not unwise, as the facilities in Denmark for shipbuilding are so slight, but if the experiment is successful this time it is proposed to repeat it.

Steam Trials.—The trial of the engines of the first-class armoured cruiser "Gromoboi," now on her way to China, held in last October before an official committee, gave the following results as regards the I.H.P. developed:—Port engine, with an average of 123 revolutions and 165 lbs. of steam in the engine—high-pressure cylinder, 1,489·13; intermediate-pressure cylinder, 1,801·05; low-pressure cylinders, 957·41 and 917·41—total, 5,165·00; amidships engine, with 171·3 lbs. steam and at 117·53 revolutions—high-pressure cylinder, 1,506·05; intermediate-pressure cylinder, 1,813·39; low-pressure cylinders, 917·57 and 1,037·43—total, 5,274·44; starboard engine, with 173·3 lbs. steam and at 124·23 revolutions—high-pressure cylinder, 1,483·07; intermediate-pressure cylinder, 1,779·14; low-pressure cylinders, 876·16 and 918·20—total, 5,056·57; or a grand total for all three engines of 15,496·01, or 996-I.H.P. more than the contract. The amount of heating area of the steam boilers (the whole heating area of these, thirty in number, being 47,021 square feet) that went to each I.H.P. of the engines showed the ease with which the boilers could be controlled at full speed, when they worked without forced draught, and gave an excess of I.H.P. in the engines.

Some further particulars as to the engines of the second-class cruiser "Variag," in addition to those already quoted, are as follows:—The main engines of the vessel, which are of 20,000-H.P., have been constructed by the firm of William Cramp & Sons, from the plans of the American naval engineer, Mr. M. N. Towne, and were most carefully planned and put together, so that it was hoped that they would develop at the official trials 24 knots instead of the 23 contracted for, and this hope was more than justified in the sequel, as the trials gave even more than 24 knots. The thirty Niclausse boilers were excellently constructed by the Stirling Boiler Company at Chicago, and throughout the trials the engines worked smoothly, not vibrating at all. The radius of action of the cruiser at 23 knots is 1,000 miles, and at 10 knots it is 3,000 miles. With a full coal supply of 1,290 tons at full speed the vessel can run 1,700 miles. The normal coal supply is 770 tons. All the vital parts of the cruiser are protected by the armoured turtle-deck, the coal protection which runs from stem to stern, and the cofferdams, which are filled with cellulose. The principal gun positions are protected by armour of 152 millimetres (6 inches) thickness. The engines and ammunition-hoists are well protected. The guns are well placed, and have for the most part a very wide angle of fire. The speed attained, viz., 24·45 knots, during the trials, was developed with 152 revolutions a minute. This for a cruiser of such displacement, viz., 6,500 tons, is, say the Russians, "an unheard-of speed, attained in no other Navy."

Vice-Admiral Dikker presided, during October, over a committee to hold trial of the steam-producing power of the steam-boilers of the battle-ship "Imperator Nicolai I.," the pressure of steam being at 200 lbs. This was a second trial, asked for by the Franco-Russian Works, the first having shown a deficiency in this respect. The engines of the battle-ship were estimated for 8,000-H.P., but

with the new boilers, which were supplied by these works, they only developed 5,000-H.P., which was undoubtedly owing to the defective steam-producing capacity of the boilers at full speed.

This is confirmed by the account of the very limited amount of heating surface allowed for each H.P., viz., 2·23 square feet in the estimate, and in reality only 1·32 square feet, for the heating area of the economisers is 7,312 square feet, so that the whole number of square feet of steam-producing area is only 10,563, instead of 17,875 as estimated. In order to obtain the estimated H.P. it is indispensable that to each unit of it there should not be less than 2·5 square feet heating area, and that at almost forced pressure of the boilers. For instance, the ratio in three typical English ships is: "Fearless," 3·41 square feet; "Vulcan," 3·1 square feet; "Sans Pareil," 2·83 square feet; all these ships having undergone 72 hours, uninterrupted working of the engines. It is, therefore, tolerably clear that the "Imperator Nicolai I." will never be able to develop a speed corresponding to the full H.P. of the engines.

Stability of Ships.—A committee has been appointed to enquire into the stability of ships with broadside armour protection, the questions to be decided being:—

1. Should the bulkheads be so placed that a ship when injured in action does not heel over more than 4°, and will the difference in dip be such that the ship maintains its stability when the unarmoured extremities are shot away?
2. Should there be fewer compartments and the bulkheads proportionately stronger?
3. As the radius of action of a torpedo is unknown, may it be taken that a ship is safe which, with two compartments filled with water, does not heel more than suggested in question 1?
4. If it is essential to place several magazines in one water-tight compartment, should the bulkheads be made (*a*) penetrable, (*b*) impenetrable, only for the column of water as far as the water-line, or (*c*) impenetrable just as much as the others?
5. Should not the dynamos be similarly protected?
6. May platforms, where there is no double bottom, be considered a bar to the influx of water when the bottom is injured, and be, therefore, made water-tight?
7. Should there be arrangement for making the ship heel in case of necessity, and if so, how great should the heel be?

STATIONS OF SHIPS IN FOREIGN WATERS IN JANUARY:—

Port Arthur.

Battle-ship—"Navarin."
Armoured cruisers—"Dimitri Donskoi," "Vladimir Monomakh."
Gun-vessels—"Gremiashchi," "Sivuch."
Torpedo-vessels—"Vsadnik," "Haidamak."
Steamer—"Moskva."

Mazampo.

Battle-ship—"Sissoi Velikie."
Gun-vessel—"Giliak."

Nagasaki.

Battle-ship—"Petropavlovsk."
Armoured cruisers—"Rossia," "Admiral Nakhimov."

Shan-hai-Kwan.

First-class cruiser—"Admiral Kornilov."

Hong-Kong.
Second-class cruiser—"Razboinik."

On the way to Port Arthur.
Second-class cruiser—"Zabiaka."

Shanghai.
Gun-vessel—"Mandchur."

Chemulpo.
Gun-vessel—"Otvajny."

Taku.
Gun-boat—"Bobr."

En route to Pacific.
Battle-ships—"Poltava," "Sevastopol."
Armoured cruiser—"Gromoboi."
Torpedo-boat destroyers—"Kasatka," "Skat," "Kit," "Som," and "Delphine."
By last advices the "Gromoboi" had left Plymouth for Algiers; the torpedo-vessels "Kasatka" and "Skat" had left Cherbourg for Cadiz; and the torpedo-vessels "Kit," "Som," and "Delphine" were at Messina.

MEDITERRANEAN.

Piræus.
Battle-ship—"Imperator Alexander I."
Gun-vessels—"Kubanets," "Khrabry."
Torpedo-cruiser—"Abrek."
Torpedo-vessels—Nos. 119 and 120.

ATLANTIC.

Left Barbados for St. Thomas.
First-class cruiser—"Herzog Edinburgski."

Left Funchal for Santa Cruz.
Second-class cruiser—"Djigit."

Constantinople, as guard-ships.
Gun-vessel—"Donets."
Steamer—"Kolcheda."

—*Kronstädtski Viéstnik.*

MILITARY NOTES.

PRINCIPAL APPOINTMENTS AND PROMOTIONS DURING JANUARY, 1901.

Field-Marshal the Rt. Hon. F. S., Earl Roberts, V.C., K.G., K.P., G.C.B., G.C.S.I., G.C.I.E., to be Commander-in-Chief. Lieut.-Colonel R. D. B. Rutherford, from the Highland Light Infantry, to be Colonel to command the 26th (Cameronians, Scottish Rifles) and the 71st (Highland Light Infantry) Regimental Districts. Colonel R. A. Gilchrist, I.S.C., to command a Second-Class District in India, and to have the temporary rank of Brigadier-General whilst so employed. Brevet Colonel A. G. Creagh, C.B., from Lieut.-Colonel R.A., to command a Second-Class District in India, with the temporary rank of Brigadier-General whilst so employed. Brevet Colonel W. H. Riddell, from Lieut.-Colonel the Bedfordshire Regiment, to be an A.A.G. in India, and to have the substantive rank of Colonel in the Army. Lieut.-Colonel J. S. Wilkins D.S.O. I.M.S., to be Colonel. Major-General and Hon. Lieut.-General H. Kent, to be Colonel of the Duke of Cambridge's Own (Middlesex Regiment). Lieut.-Colonel (temporary Colonel) V. J. Dawson, Commanding the Irish Guards Regiment and Regimental District, to be Colonel. Colonel F. S. F. Stokes, from h.p. to be Colonel, to command the 83rd Regimental District (The Royal Irish Rifles). Brevet Colonel J. W. T. Hume, from Lieut.-Colonel h.p. to be Colonel to command the 45th Regimental District (The Sherwood Foresters, Derbyshire Regiment). Major-General W. F. Kelly, C.B., to be A.G. Field Force, South Africa. Lieut.-Colonel M. O. Little, 9th Lancers, to be a Brigadier-General on the Staff, to command a Cavalry Brigade in South Africa and to have the local rank of Brigadier-General whilst so employed. Major-General (local Lieut.-General) Sir G. Luck, K.C.B., Commanding the Troops in Bengal, to be Lieut.-General. Lieut.-Colonel E. B. Appelbe, A.O.D., Chief Ordnance Officer, is granted the local rank of Colonel in South Africa, whilst so employed. Brevet Colonel R. A. Hickson, from Lieut.-Colonel h.p., to be Colonel to command the 3rd Regimental District (the Buffs, East Kent Regiment). Colonel A. G. Wavell is appointed temporarily a D.A.G. The temporary appointment of Colonel P. H. Hammond as Colonel on the Staff for Royal Artillery is confirmed. Colonel F. H. Whitby, from A.A.G., India, to be a D.A.G in India, and to have the temporary rank of Brigadier-General whilst so employed. Colonel G. L. R. Richardson, C.B., C.I.E. (now a local Major-General commanding a Brigade, China Field Force), to be a Colonel on the Staff in India. Colonel G. H. More-Molyneux, C.B., D.S.O., I.S.C., to command a Second-Class District in India, with the temporary rank of Brigadier-General whilst so employed. Colonel (temporary Brigadier-General) H. B. McCall, C.B., from D.A.G. in India to command a Second-Class District in India, with the temporary rank of Brigadier-General whilst so employed. Lieut.-Colonel H. N. McRea, C.B., I.S.C., to be A.D.C. to the Queen, and to have the Brevet rank of Colonel in the Army. Lieut.-Colonel and Brevet Colonel J. Reeves, from Princess Victoria's (Royal Irish Fusiliers), to be a Brigadier-General on the Staff in South Africa, to command the Eastern Lines of Communication, East of Dalmanutha, and to have the local rank of Brigadier-General whilst so employed. Lieut.-Colonel and Hon. Colonel F. G. Blair-

Imperial Yeomanry, to be a Colonel on the Staff to command the Mounted Troops, 8th Division. Lieut.-Colonel N. P. Fowell, R.G.A., to be Colonel. Lieut-Colonel F. T. M. Beaver, R.F.A., to be Colonel. General the Rt. Hon. Sir Redvers H. Buller, V.C., G.C.B., K.C.M.G., resumes the appointment of Lieut.-General on the Staff to command the Troops at Aldershot. Lieut.-General Sir W. F. Butler, K.C.B., resumes the appointment of Lieut.-General on the Staff to command the Troops in the Western District. Major-General Sir H. C. Chermside, G.C.M.G., C.B., R.E., resumes the appointment of Major-General on the Staff to command the Troops in the Curragh District. Colonel (local Lieut.-General) Sir A. Gaselee, K.C.B., A.D.C., I.S.C., is appointed Q.M.G. in India, with the temporary rank of Major-General, whilst so employed. Colonel C. Kennedy resumes the appointment of A.A.G. Colonel the Hon. F. W. Stopford, C.B., to be a D.A.G. Colonel (since promoted Major-General) W. H. Mackinnon, from h.p., to be a Colonel on the Staff. Lieut.-Colonel R. H. W. H. Harris, the East Surrey Regiment, to be Colonel.

The King has been pleased to appoint His Majesty William II., German Emperor, King of Prussia, K.G., G.C.V.O., Hon. Admiral of the Fleet, Colonel-in-Chief 1st (Royal) Dragoons, to be a Field-Marshal in the Army, on the occasion of the anniversary of His Majesty's Birthday.

HOME.—The following are the details of practical test firing against Mr. Wyley Lord's armoured bicycle (*vide* last month's JOURNAL) carried out at Kingsdown rifle range on 24th January, 1901, by permission of the Commandant R.M.L.I., Walmer Depôt.

Rounds 1 to 46 by Lieutenant Grover, A. I. of M.

Rifle.—Service Lee-Enfield Mark I.

Ammunition.—Service Mark II. S. A. ball ·303 in cordite.

Object.—To test under service conditions :—

1. Liability to be hit.
2. The damaging effect of the rifle fire.
3. The cover given to the cyclist rifleman.

Background.—A service practice target, in front of which the bicycle, complete as ridden, was dropped, with the shield wheel vertical, on top of earth ridge, which afforded an unlevel bearing and great exposure to the machine.

Light.—Bright sunshine behind the butts.

Wind.—Gusty and irregular, with cross currents.

Table of Ranges, Rounds Fired, Hits, and Effects.

Yards.	Rounds.	Target hits.	Cycle hits.	Bullet Effects.
1,000	9	3	0	*Nil.*
800	8	3	0	*Nil.*
600	9	4	1	Hit shield ½ inch from, but no crack. Grazed tyre deeply, but mark disappeared. Hit shield 2 inches from edge, but no crack.
500	10	7	2	Three hit shield within 8 inches of centre, no crack.
400	15	5	5	Fourth broke weak makeshift washer holding shield.[1] Fifth passed between shield and rim, perforating rim without disabling it. The shield made by error ½-inch diameter too small.

[1] Which latter, however, remained in position.

Result.—The penetration of shield, or any crack or projection behind plate. Indentation trifling, and left no mark of glancing bullets. No damage to any part of

the rest of the cycle exposed to the target hits. The machine was forced backwards less than half-an-inch by the eight hits, and no part was refixed or re-adjusted during the fifty-one rounds. Under favourable background conditions for the rifle the machine was difficult to see at either range without glasses, whilst in the open, with shield up and man behind it, the whole machine was afterwards seen to be less distinguishable than a man's head. The effect when hit was practically nil, as without any repair whatever the cycle remained serviceable, and was ridden home miles from the range, the rider lifting it over park iron hurdles *en route*.

The following remarks were made by Colonel H. M. Burgess, late R.A. and F.M.-I.G., Com. Ordnance, etc.:—"I was at the butts during the firing of forty-six rounds above-mentioned. I then fired five rounds at 400 yards, and testify to the difficulty of sighting and hitting, through invisibility at that range. I rode the cycle about half-a-mile just as it came from the butts firing. I can speak as to the fairness of the trial and correctness of above report, and do so from technical knowledge and experience as to the effects of the hits, cover, etc., derived during the early experiments of the Iron Plate Committee at S. G——— and in manufacturing departments.

As an indifferent rider, I found the weight of the shield act as a fly-wheel, a positive advantage in overcoming obstacles, when moving across country, and confirms the riding over rough hilly district, about 65 miles by an amateur, the first day at General Sir F. Maurice's Sussex manœuvres on 4th August, 1900.

An average cyclist rifleman could dismount and drop under cover of shield, and have his rifle in position ready to fire in five seconds. He could remount and ride on in pursuit or retirement as quickly, because this cycle has nothing about it that necessitates adjustment or detachment, or loose parts. Naturally it is designed strongly, to need little care in campaigning. Of course, the shield could be detached in peace-time, and the capital entrenching spade, which is so neatly affixed as a mudguard, can be detached promptly for entrenchment, whilst the rifleman is lying under shield cover.

No other system of easily carried shield cover has approached this result, and I think bicycles of this remarkable utility should form, say, one-fourth of the supply to the Army, and have no doubt of their tactical value.

I also attended experiments on the same range on 8th February, 1901, to test ordinary firing *from* the shield and through the loop-hole in lying-down position, which was found simple and easy by the marksman, though the first time he shot through it.

Magazine fire ditto.

Result of 23 rounds at 500 yards—83 points out of a possible 92 = 91 per cent.

Loop-hole allowed sighting for ranges from close to 2,600 yards.

Much cover, but incomplete, was given to a rifleman in a sitting position."

12th January, 1901.

SOUTH AFRICA.—A Blue-book has been recently issued containing the report of the Royal Commission appointed to consider and report upon the treatment of the sick and wounded during the South African campaign. The Commissioners have divided their report into four headings. Part I. deals with the proceedings taken by the Commissioners and the work done by them, and upon the character of the evidence given. Part II. deals with the more general conclusions of the Commissioners. The first point discussed is the understaffing of the Army Medical Corps before the war, with regard to which the Commissioners entirely exonerate the Director-General and his staff, who had for a considerable time before the war vainly asked for an increase of the corps. On the other hand, they do not altogether excuse the medical authorities in South Africa from blame in not having drawn the attention of the War Office at an early stage to the fact that field hospitals were being abstracted from units already organised to supply deficiencies elsewhere. The report does not endorse many of the sweeping charges that have been made against the officers of the Royal Army Medical Corps, but, whilst speaking most highly of that Corps, admits that a certain feeling does exist against them, and that there is need for considerable improvement. The report says:—

"But in connection with the subject of the general efficiency of officers of the Royal Army Medical Corps we must refer to a fact which ought not to be ignored, either in

the interest of the Royal Army Medical Corps itself, or of the Army generally, and that is the existence on the part of many military officers of a feeling of distrust of the skill and professional experience of doctors of the Royal Army Medical Corps as compared with civil doctors. To a great extent we believe this mistrust to be ill-founded. That it is not wholly unfounded is to be explained by the difficulties under which the officers of the Royal Army Medical Corps have hitherto laboured.

The Royal Army Medical Corps has been undermanned even in time of peace, and its staff much overworked. In consequence the majority of the officers who have no sufficient holidays or leave of absence, and no proper opportunities of studying or of keeping abreast with recent advances in the practice of medicine and surgery. The authorities have experienced, probably to some extent in consequence of the above facts, a difficulty in obtaining men of good professional standing to join the Royal Army Medical Corps, and the insufficiency of officers has occasionally led in the present war to men of the Royal Army Medical Corps being employed who were not properly fit for the due discharge of the duties cast upon them. Some few officers who had retired, or practically retired, and who were not fitted for active work have been employed. Some of these, being senior men, were put in charge of important hospitals: for in the Royal Army Medical Corps the practice of appointing men to the more important posts according to mere seniority appears to be too rigidly adhered to. The result of such appointments has been that the hospitals to which they were appointed as chiefs have not been properly organised or superintended, and the hospitals have suffered in consequence. It should be clearly understood that these exceptional instances were but two or three in number.

We think that steps should be taken immediately after this war is ended, or at some other suitable time, whereby :—

1. The Staff of the Royal Army Medical Corps may be permanently enlarged, and due provision may be made for its further necessary and speedy enlargement in times of great wars.
2. Inducements may be offered to ensure a continuous supply to the corps of sufficient men of good professional attainment ; and
3. The men who have joined may be kept as a body thoroughly acquainted with the general progress made in professional subjects and at a high professional standard of efficiency.

The means by which the above results can be best attained require careful expert investigation and consideration, and cannot be adequately dealt with by us. They should form the principal subject for consideration on the part of the departmental or other committee whose constitution is recommended to us at the end of this respect.

Though advocating the retention of military rank by the R.A.M.C. the Commissioners think that there is rather too much militarism in the hospitals.

While admitting to the full this distinction, and the necessity for military rank on the part of the officers of the Royal Army Medical Corps and of military discipline in the hospitals, we think that in some cases the military point of view has been carried unnecessarily far. There has been a tendency on the part of some of the officers, and still more so on the part of some non-commissioned officers and men of the Royal Army Medical Corps, to treat the hospitals too much as if they were barracks, and to regard the patients in the hospital too much as soldiers and not sufficiently as patients. We may illustrate this by reference to a practice which in itself is of no great importance ; we refer to the fact that all patients in the wards of a military hospital, who are able to do so, must stand at attention when officers enter the ward."

Part III. of the report contains a detailed investigation into the work of the field hospitals with every part of the Army in South Africa. Part IV. gives a number of suggestions with a view of remedying defects. The suggestions are :—

1. The establishment of a staff of officers and orderlies of the R.A.M.C. sufficient to discharge adequately the duties ordinarily cast upon it in peace-times and for smaller wars.
2. That regulations and provisions should be made to secure rapidly large numbers of surgeons and trained orderlies and large supplies of hospital equipment in case of a great war.

3. The attraction to the R.A.M.C. of a regular supply of officers of good professional attainments, and the improvement of their position by the allowance of sufficient holidays, by provisions for scientific study, and by promotion by merit rather than by seniority.
4. The employment of more nurses for fixed hospitals.
5. The appointment of sanitary officers.
6. The improvement of the existing ambulance wagons, which they describe elsewhere as heavy, uncomfortable, and antiquated.
7. The selection of a better form of hospital-tents.

The Commissioners also think that the committee to be appointed might usefully consider :—

a. Whether the R.A.M.C. should have exclusive possession and control over all necessaries for the sick and wounded so as to avoid requisitioning upon the Army Service Corps.
b. Whether the administrative and clerical duties of the principal medical officers can be lightened and reports and returns shortened.
c. Whether the men of the bearer companies not engaged in the field could be employed to assist in the field hospitals, and the whole be under one chief officer.
d. Whether in peace a regimental doctor should be attached to each regiment for a fixed time.
e. Whether general hospitals could be advantageously divided into smaller units.
f. Whether it is practicable and advisable that some organised body should control the receipt and distribution of charitable gifts for the sick and wounded.

Further, beyond the strict scope of their inquiry, the Commissioners suggest that strict investigation should be made in all military hospitals to prevent pilfering of stimulants, comforts or property of patients, or the receipt of bribes by orderlies : that officers should as far as possible relax the strict military rules generally adopted in military hospitals : and that R.A.M.C. officers should be made fully acquainted with the fact that they are entitled, in cases of emergency, to buy necessaries for their hospitals at Government expense. The Blue-book ends with the following conclusion :—

"We have now, to the best of our ability, pointed out in what respects, and to what extent, complaints with regard to the care of the sick and wounded in the present South African campaign are well founded. We have also called attention to the causes, so far as we can trace them, of any undue suffering by patients during the campaign. And where, in our opinion, mistakes and oversights on the part of the responsible authorities have occurred we have referred to them. We have also stated what steps ought to be taken with a view of remedying the evils we have noticed. Those evils were serious, and ought not to be minimised. But, in concluding our report, we desire to say that in our judgment, reviewing the campaign as a whole, it has not been one where it can properly be said that the medical and hospital arrangements have broken down. There has been nothing in the nature of a scandal with regard to the care of the sick and wounded : no general or widespread neglect of patients, or indifference to their suffering. And all witnesses of experience in other wars are practically unanimous in the view that, taking it all in all, in no campaign have the sick and wounded been so well looked after as they have been in this."

FRANCE.—Various decrees, dated 28th December, 1900, fix as follows the organisation of the Colonial Army, which by virtue of the law of the 7th July, 1900, has been transferred, since the 1st January of the present year, from the Minister of Marine to the War Department.

The Colonial Infantry consists—

Firstly, in France : Of 12 regiments of 3 battalions of 4 companies each, plus one reserve section with a complementary cadre of 14 officers and 19 non-commissioned officers.

The strength of the company is 3 officers and 125 non-commissioned officers and men; that of the regiment 71 officers and 1,641 non-commissioned officers and men. These 12 regiments form 3 divisions. In the event of mobilisation, an army corps is organised by utilising the units of the Colonial troops quartered in France and who are fit to take the field.

Secondly, in the Colonies: Of 6 regiments, of which 2 consist of 4, 3 of 3, and 1 of 2 battalions, all being composed of 4 companies, stationed in Indo-China, Madagascar, and West Africa; 2 battalions of 4 companies in New Caledonia and Martinique; 1 battalion of 2 companies in Guiana; 1 company at Guadaloupe, and 1 at Tahiti. The Colonial Infantry consists, besides, of native troops from Annam, Tonkin, Senegal, and Madagascar.

The total of these forces represent an effective of 2,362 officers and 37,219 non-commissioned officers and men, of whom 1,237 officers and 20,716 non-commissioned officers and men are stationed in France.

The Colonial Artillery consists—

Firstly, in France: Of 3 regiments of 12 batteries each, of which 4 are field, 2 mountain, and 6 foot; 5 companies of workmen, and 1 of artificers. The field and mountain batteries have an effective of 4 officers and 103 men; the foot batteries of 5 officers and 150 men. In the event of mobilisation these batteries form the corps artillery of the Colonial troops.

Secondly, in the Colonies: Of 1 regiment of 8 batteries at Tonkin; 1 regiment of 6 batteries in Cochin China; 1 foot battery in New Caledonia; 1 foot battery section at Tahiti; 3 groups in West Africa, viz.: 1 group of 3 batteries at Daka, 1 of 1 foot battery and 1 company of drivers at Senegal, and 1 of 1 battery and 1 company of drivers in the Soudan; 2 groups in Madagascar, viz.: 1 group of 3 batteries at Diego-Suarez, and 1 of 3 batteries and 3 companies of drivers at Emyrna; 1 group of 3 batteries at Martinique; 1 battery section at Guadaloupe; 1 battery at Chari; 1 battery at Réunion; 1 company of workmen in the Soudan; and detachments of companies of workmen in the other Colonies.—*Bulletin de la Presse et de la Bibliographie Militaires.*

RUSSIA.—The Russian Army Estimates for 1901, according to *Die Vedette*, are as follows; those for 1900 are added for the purpose of comparison:—

—	1901.	1900.
	Roubles.	Roubles.
Central Administration	2,716,301	2,583,457
Local Administration	9,231,432	9,037,149
Educational and Technical Establishments ...	9,772,929	9,254,308
Medical Establishments and Services	4,536,268	4,320,945
Clothing and Equipment	25,003,404	26,183,522
Victualling	46,471,714	45,017,208
Forage	18,618,021	18,084,551
Pay and Allowances	72,606,927	70,397,782
Rent and Maintenance of Quarters	21,180,774	20,671,383
Buildings	25,349,968	24,629,692
Repairs and Improvement of Artillery	6,000,355	7,877,331
Ammunition	2,838,216	2,884,495
Transport and Travelling Expenses	10,994,449	11,085,796
Enrolment of Recruits	1,424,038	1,290,000
Instruction of Reservists and Militia	2,883,097	3,810,492
Military Government of Turkestan	1,387,554	1,284,398
Maintenance of the Gendarmes	3,960,489	3,804,070
Rewards and Assistance	3,887,935	3,724,065
Retired Pay	5,421,188	5,331,129
Special Expenses	612,726	616,127
Kwan-tung Peninsula	7,340,721	6,602,683
Re-armament	24,230,133	24,220,773
Miscellaneous Expenses	2,635,924	3,198,469
Reserve Funds	6,325,308	9,838,861
Expense of preparing next year's estimates ...	8,595,000	8,595,000
Total	£324,024,871	£324,343,686

The medical report of the Russian Army has recently been published for 1897. The net average effective for the year was 913,435, and the number of cases of sickness was 314,472, or 344·27 per 1,000. There were 5,010 deaths, not including suicides and accidents, or 5·48 per 1,000. Turkestan was the most unhealthy district, the cases of sickness being 858·9 per 1,000; while in Wilna, the healthiest district, the rate per 1,000 was only 224·1. The death-rate varied from 11·35 per 1,000 on the Trans-Caspian region to 1·9 per 1,000 in the district of Irkutsk. The death-rate reached 6·96 per 1,000 in the 1st Army Corps at St. Petersburg and only 2·28 in the 2nd Cavalry Corps at Warsaw. Deaths from disease were greatest among men of more than two years' service; but it must not be forgotten that the Cossacks serve two or three years at their homes before they join the colours. Ninety-five per cent. of the deaths were of men between 21 and 25 years of age. There were 285 cases of suicide, 141 of them among men of more than two years' service.—*Times.*

Every year the 9th Cavalry Division executes special manœuvres, with its artillery, at Bielaia Tserkoev. The weather this year was very favourable, but the ground was not so much so, for owing to it being sowing time the cavalry was obliged to manœuvre on highly cultivated land, amidst clouds of thick dust. The director of the manœuvers, Prince Tchartchavadzi, directed all his energies with a view to obtaining mobility as the essential condition of cavalry tactics, especially in the preparation for the attack and in the decisive shock action. The chief points to which he directed attention were as follows :—

1. Not to adhere to any particular fighting formation, but to adopt whatever was best suited to the circumstances, as revealed by a minute reconnaissance. It should not be forgotten that, in the cavalry, all formations are good, provided only that the propitious moment for attack is not allowed to slip.
2. To leave the greatest possible initiative to all unit commanders, provided their action agrees with the exigencies of the situation, and with the general idea.
3. To insist on manœuvres suitable for leading up to the attack, and to pass, as late as possible, from reserve to battle formations. This change should take place immediately before the "charge" and when the reconnaissance is completed, when the proper bearings have been taken, and, consequently, when the guidance of the unit is thoroughly assured. Manœuvre for the cavalry is similar to aiming in the infantry; an infantryman may aim several times and even alter his sights before firing, but once the bullet has left the rifle it is impossible to recall it. When a cavalry commander launches his unit in the attack, it is like the bullet from the rifle.

The Grand Duke Nicholas, Inspector-General of Cavalry, ordered some manœuvres against a skeleton enemy, and took the direct supervision of them himself.

The 1st Regiment of Oural Cossacks, which was thrown out as an advanced guard, deployed into lava, and manœuvered skilfully, so as to draw the enemy's attack, from which they were protected, in order to take the offensive afterwards. The division, which had formed up as a reserve, under cover of the ground, was then deployed and launched on the attack, two regiments in the first line, one regiment in the second line, echeloned behind the left flank, and one regiment in the third line behind the centre. The movements were well carried out in the given time; the attack was well directed. The Grand Duke merely called attention to the diminution of the pace, to the seat of the men, and to the commands by signal; finally, in the battle movements to the preservation of and to the rapid re-adjustment of the intervals.

During the same special assembly of the 9th Cavalry Division, General Dragomiroff, commanding the troops in the Kiev district, was present at a field-firing manœuvre. This was accomplished by three squadrons of dragoons with a Cossack battery. These units advanced at a gallop; the artillery quickly got into action and

opened fire on the enemy's artillery. The dragoons advanced to within about 1,000 paces of the enemy, dismounted, and vigorously pushed the attack against targets representing a hostile force. Two squadrons were in the skirmishing line, and the third formed the reserve. The advance was made by alternate rushes, one squadron advancing rapidly, the other remaining lying down and covering the advance with concentrated fire, and on being joined by the reserve, the whole at once advanced cheering to the attack. Once the enemy's position was taken, two volleys were poured into the retreating foe. At this moment the assailants were informed that a counter-stroke was about to be delivered on them by the hostile cavalry. The horse artillery battery at once took up a new position for firing on this cavalry, represented by targets. The cavalry brigade deployed with five squadrons in the first line, two in echelon, and two reserve (the three squadrons having rapidly remounted), and at once charged. The flank squadrons were obliged to cross the front of the battery in action, and the latter immediately ceased firing. This terminated the attack. The following observations were subsequently made by General Dragomiroff :—

1. During instruction faults should never be feared, because one wishes to learn, and because errors serve greatly to illustrate instruction. He who never makes a mistake never does anything of importance.
2. Everyone taking part in it should understand the object of a manœuvre. Consequently it matters little if there are faults, and even absurdities during manœuvres, and there is no need to fear them, provided the chiefs see them, and point out to their units the nature of the absurdities, and explain the reason of them. This results in knowledge being gained, and one learns what should never be done or permitted in war.
3. The transmission of orders would appear to be a very simple matter, yet how many examples are there of an inexact transmission which has been the cause of the loss of important bodies of troops ! Those charged with the transmission of orders should therefore be compelled to invariably repeat them, in order that such a practice should become a regular habit ; in war one always does well what one is accustomed to do in peace-time.
4. A rapid sketch is the best method by which each officer commanding a unit may best recognise his own position with regard to those of others. With this object, once the scheme is given out, the commander of a detachment should assemble all the officers commanding units under him and dispose them, with regard to one another, in the order in which the troops under their command would actually be. This would greatly minimise chances of errors and misunderstanding in the carrying out of movements.
5. Horse Artillery, in consequence of the rapidity of cavalry shock action, should be well to the front, so as to have time to concentrate its fire against the hostile troops who are being attacked, or who are attacking, and to further the success of its own cavalry. The cavalry, on the first shot of their artillery, should advance to the attack, and when it masks its own artillery, the latter should direct its fire against the enemy's artillery. Horse artillery thus operates in an opposite manner to field artillery and commences where the latter ends, for the latter first concentrates its fire on the hostile artillery, and then passes to the preparation for the attack.
6. Troops protecting the flanks should reconnoitre the ground for at least from 3 to 4 kilometres, and with this object should be as much in advance and on the flanks as possible.
7. The cavalry should never act on foot except when it cannot attain its object mounted ; it should therefore remember that it is a very expensive infantry, and in consequence does not operate as infantry, but with much greater rapidity and boldness ; whilst appearing to close, it does not lead the fight up to the decisive attack, but endeavours above all to gain time either to allow its troops to arrive on the spot for that purpose, or to escape easily from the adversary's coups. Here bounce is a cavalry virtue.—*La France Militaire.*

The medical report of the Russian Army has recently been published for 1897. The net average effective for the year was 913,435, and the number of cases of sickness was 314,472, or 344·27 per 1,000. There were 5,010 deaths, not including suicides and accidents, or 5·48 per 1,000. Turkestan was the most unhealthy district, the cases of sickness being 858·9 per 1,000; while in Wilna, the healthiest district, the rate per 1,000 was only 224·1. The death-rate varied from 11·35 per 1,000 on the Trans-Caspian region to 1·9 per 1,000 in the district of Irkutsk. The death-rate reached 6·96 per 1,000 in the 1st Army Corps at St. Petersburg and only 2·28 in the 2nd Cavalry Corps at Warsaw. Deaths from disease were greatest among men of more than two years' service; but it must not be forgotten that the Cossacks serve two or three years at their homes before they join the colours. Ninety-five per cent. of the deaths were of men between 21 and 25 years of age. There were 285 cases of suicide, 141 of them among men of more than two years' service.—*Times.*

Every year the 9th Cavalry Division executes special manœuvres, with its artillery, at Biclaia Tserkoev. The weather this year was very favourable, but the ground was not so much so, for owing to it being sowing time the cavalry was obliged to manœuvre on highly cultivated land, amidst clouds of thick dust. The director of the manœuvers, Prince Tchartchavadzi, directed all his energies with a view to obtaining mobility as the essential condition of cavalry tactics, especially in the preparation for the attack and in the decisive shock action. The chief points to which he directed attention were as follows :—

1. Not to adhere to any particular fighting formation, but to adopt whatever was best suited to the circumstances, as revealed by a minute reconnaissance. It should not be forgotten that, in the cavalry, all formations are good, provided only that the propitious moment for attack is not allowed to slip.
2. To leave the greatest possible initiative to all unit commanders, provided their action agrees with the exigencies of the situation, and with the general idea.
3. To insist on manœuvres suitable for leading up to the attack, and to pass, as late as possible, from reserve to battle formations. This change should take place immediately before the "charge" and when the reconnaissance is completed, when the proper bearings have been taken, and, consequently, when the guidance of the unit is thoroughly assured. Manœuvre for the cavalry is similar to aiming in the infantry; an infantryman may aim several times and even alter his sights before firing, but once the bullet has left the rifle it is impossible to recall it. When a cavalry commander launches his unit in the attack, it is like the bullet from the rifle.

The Grand Duke Nicholas, Inspector-General of Cavalry, ordered some manœuvres against a skeleton enemy, and took the direct supervision of them himself.

The 1st Regiment of Oural Cossacks, which was thrown out as an advanced guard, deployed into lava, and manœuvered skilfully, so as to draw the enemy's attack, from which they were protected, in order to take the offensive afterwards. The division, which had formed up as a reserve, under cover of the ground, was then deployed and launched on the attack, two regiments in the first line, one regiment in the second line, echeloned behind the left flank, and one regiment in the third line behind the centre. The movements were well carried out in the given time; the attack was well directed. The Grand Duke merely called attention to the diminution of the pace, to the seat of the men, and to the commands by signal; finally, in the battle movements to the preservation of and to the rapid re-adjustment of the intervals.

During the same special assembly of the 9th Cavalry Division, General Dragomiroff, commanding the troops in the Kiev district, was present at a field-firing manœuvre. This was accomplished by three squadrons of dragoons with a Cossack battery. These units advanced at a gallop; the artillery quickly got into action and

opened fire on the enemy's artillery. The dragoons advanced to within about 1,000 paces of the enemy, dismounted, and vigorously pushed the attack against targets representing a hostile force. Two squadrons were in the skirmishing line, and the third formed the reserve. The advance was made by alternate rushes, one squadron advancing rapidly, the other remaining lying down and covering the advance with concentrated fire, and on being joined by the reserve, the whole at once advanced cheering to the attack. Once the enemy's position was taken, two volleys were poured into the retreating foe. At this moment the assailants were informed that a counter-stroke was about to be delivered on them by the hostile cavalry. The horse artillery battery at once took up a new position for firing on this cavalry, represented by targets. The cavalry brigade deployed with five squadrons in the first line, two in echelon, and two reserve (the three squadrons having rapidly remounted), and at once charged. The flank squadrons were obliged to cross the front of the battery in action, and the latter immediately ceased firing. This terminated the attack. The following observations were subsequently made by General Dragomiroff :—

1. During instruction faults should never be feared, because one wishes to learn, and because errors serve greatly to illustrate instruction. He who never makes a mistake never does anything of importance.
2. Everyone taking part in it should understand the object of a manœuvre. Consequently it matters little if there are faults, and even absurdities during manœuvres, and there is no need to fear them, provided the chiefs see them, and point out to their units the nature of the absurdities, and explain the reason of them. This results in knowledge being gained, and one learns what should never be done or permitted in war.
3. The transmission of orders would appear to be a very simple matter, yet how many examples are there of an inexact transmission which has been the cause of the loss of important bodies of troops! Those charged with the transmission of orders should therefore be compelled to invariably repeat them, in order that such a practice should become a regular habit ; in war one always does well what one is accustomed to do in peace-time.
4. A rapid sketch is the best method by which each officer commanding a unit may best recognise his own position with regard to those of others. With this object, once the scheme is given out, the commander of a detachment should assemble all the officers commanding units under him and dispose them, with regard to one another, in the order in which the troops under their command would actually be. This would greatly minimise chances of errors and misunderstanding in the carrying out of movements.
5. Horse Artillery, in consequence of the rapidity of cavalry shock action, should be well to the front, so as to have time to concentrate its fire against the hostile troops who are being attacked, or who are attacking, and to further the success of its own cavalry. The cavalry, on the first shot of their artillery, should advance to the attack, and when it masks its own artillery, the latter should direct its fire against the enemy's artillery. Horse artillery thus operates in an opposite manner to field artillery and commences where the latter ends, for the latter first concentrates its fire on the hostile artillery, and then passes to the preparation for the attack.
6. Troops protecting the flanks should reconnoitre the ground for at least from 3 to 4 kilometres, and with this object should be as much in advance and on the flanks as possible.
7. The cavalry should never act on foot except when it cannot attain its object mounted ; it should therefore remember that it is a very expensive infantry, and in consequence does not operate as infantry, but with much greater rapidity and boldness ; whilst appearing to close, it does not lead the fight up to the decisive attack, but endeavours above all to gain time either to allow its troops to arrive on the spot for that purpose, or to escape easily from the adversary's coups. Here bounce is a cavalry virtue.—*La France Militaire.*

According to the *Rouskii Invalid*, the latest military events in China have demonstrated the necessity of having many mounted troops in those districts. The Chinese Regulars and the Boxers, as a rule, take to flight when the hostile infantry is within four or five hundred paces of them, and it is most essential that there should be mounted troops even with small units, to follow them up and complete the rout. In Manchuria, on the other hand, it is indispensable that Russian detachments should appear unexpectedly at many different places in order to prevent piratical attacks on the railway.

With this view, the scouting detachments of many of the East Siberian rifle regiments have been transformed into mounted infantry detachments. General Rennenkampf specially reports that in an action on the 1st December, in Manchuria, these improvised mounted troops rendered the greatest possible service.

Such an organisation is by no means a novelty in the Russian Army. During the expedition to Kokand in 1875-76, General Skobelev took 250 picked men from the 1st Turkestan Rifle Brigade, and formed them into a squadron, which operated sometimes with the Cossacks and sometimes independently. This mounted infantry was most useful. In the pursuit or in a turning movement on the enemy's lines of retreat they frequently covered more than 100 kilometres in 24 hours.

SPAIN.—One of the first objects of the reforms proposed by the War Minister in the Spanish Chamber, on 29th November last, was the increase of the organic and tactical units which have become reduced to a ridiculous extent; as it was useless thinking of demanding higher credits from Parliament than the War Budget voted last year, it was necessary to change the military division of the country and the distribution of the troops, and to be content with a budget effective of 80,000 rank and file; in summer this number could be diminished, and by the exercise of certain economies, it will be possible to have nearly 100,000 men under arms during the period of the autumn manœuvres.

Instead of the 8 military districts, into which Spain is at present divided, there will be only 6, the headquarters of which, in numerical order, will be at Madrid, Seville, Valencia, Barcelona, Burgos, and Valladolid. The district of Saragossa and Corognia are done away with. Each of the 6 districts will be occupied, in peace-time, by an army corps bearing the same number as the district, and will consist of 2 infantry divisions, 1 artillery, and 1 cavalry regiment (lancers or dragoons), 1 mixed engineer battalion (5 sappers and 1 telegraph company), a commissariat, and an ambulance train. Each of the 12 infantry divisions will be made up by 2 infantry brigades of 2 regiments of 3 battalions each, a light infantry battalion, a field artillery regiment, a light cavalry regiment, and the necessary commissariat and hospital units. With the surplus cavalry regiments an independent division will be formed consisting of 2 brigades of 2 regiments each.

The organisation of the military forces in Africa and in the Balearic and Canary Islands will remain almost without change. In each army corps inspectors of artillery, engineers, commissariat and military hospitals will be done away with, and six sections will be formed for the supervision of these different services.

In addition to the 56 Line regiments of 2 battalions each and the 20 light infantry battalions which at present make up the Active Army, 48 regiments of 3 battalions each and 12 light infantry battalions are about to be organised; half of these regiments will be at the normal and half at a reduced effective; the 3rd battalions of these last raised regiments will merely consist of cadres. A distinction will be made between the war, the manœuvre, and the budget effective; the latter may be either normal or reduced. Reserve battalions and depôts will be organised with the 56 infantry reserve regiments; the scheme lays down no eventual formations for these units in the event of war.

Of the 28 present cavalry regiments 4 will be suppressed and a new squadron will be formed for each of the 24 remaining regiments, which will thus have 5 active squadrons and in addition the cadres of a depôt squadron each. The 2 cavalry regiments which are unattached, after the organisation of the above-mentioned army corps, will

be brigaded and attached to the IVth Army Corps at Barcelona. The men belonging to the 14 cavalry reserve regiments, each corresponding to 2 active regiments, as well as those men who are attached to artillery or engineer depôts, or who having served in the commissariat or medical department, or in the staff topographical brigade, will be sent to 6 depôts, which will be formed for each of the army corps districts. All the infantry and cavalry corps will be provided with regimental *matériel* and with pack mules.

The 12th Horse Artillery Regiment, called "light," will be attached to the Cavalry Division; a regiment of 4 batteries, armed with 9-centimetre guns, and the Siege Artillery Regiment will be attached to the 1st Army Corps; 11 field artillery regiments of 3 Q.F. batteries will be each attached to the first 11 infantry divisions; the IIIrd Mountain Artillery Regiment will be attached to the 12th Infantry Division, and the two other mountain artillery regiments will be attached, one to the IVth and the other to the Vth Army Corps. According, as the economies realised will permit of it, the IInd, IIIrd, and VIth Army Corps will be provided with artillery regiments. 12 battalions of garrison artillery will also be organised.

The engineers will be divided into 4 regiments and 2 independent battalions of sappers. 1 telegraph battalion, 1 railway battalion, 1 pontoon regiment, and 1 balloon company.

The commissariat brigades will be done away with, and that department and its *matériel* will be distributed amongst the army corps. A transport corps will be formed. The medical corps will be similarly treated.

In the headquarters the following changes will be introduced, viz., the number of sections will be reduced to 8; the Consultative War Junta will be done away with; a grand general staff will be formed; the higher council of military justice will be re-organised, and a number of useless posts which are merely a refuge for a number of general and special officers, abolished. On the other hand, 2 inspector-generals of army corps will be created.

In the General Staff the rank of marshal is abolished, and in future this exalted grade will be only conferred on those who have rendered altogether exceptional services. Generals will pass into the reserve at the following ages:—

Lieut.-Generals at 70 years.
Generals of Division at 66 years.
Brigadier-Generals „ 64 „

Vacancies resulting from this lowering of age will be absorbed. The age limit for the retirement of officers will be reduced by two years in all ranks, that is to say, that second and first lieutenants must leave the Service at the age of 48, captains at 54, majors and lieut.-colonels at 58, and colonels at 60. In the infantry, cavalry, and staff, second lieutenants will be brought forward for promotion after three years' service in that rank.

The preparatory school at Trujillo, that of the "Guardia Civil" and the carabineers will be abolished, the number of admissions into the military academies will be reduced, the staff corps and the Higher War School, from which it is recruited, will be re-organised.—*Précis* from *Revue Militaire Suisse.*

The Law fixing the strength of the Spanish permanent Army for 1901 was passed on 30th January last as follows:—

"*Article I.*—The effective of the permanent Army for the year 1901 is fixed at 80,000 men.

"*Article II.*—The Minister of War is authorised to increase this effective from time to time, should he consider it necessary, on condition that the outlay does not exceed the credits laid down by the Budget. The Minister of War is also authorised to give temporary leave of absence when and how he thinks fit."

The Spanish Minister of War intends to lay before the Cortes a scheme for obligatory military service; the *Correspondencia Militar* in a lengthy article, shows how it would be possible to give military instruction to a greater number of young men without increase of expense. It is impossible, says that journal, for budgetary

reasons, to give military instruction to the 130,000 men, who may each year be placed at the disposal of the military authorities. If the period of active service were reduced from three to two years (which would have the effect of renewing the permanent effective by half instead of by a third, the present effective being 80,000 men) 40,000 recruits would be enrolled each year. The permanent effective would be increased by 30,000 for four months in the year, and would be decreased by 15,000 during the remaining eight months. By this means 70,000 recruits would receive instruction yearly. There would thus be 110,000 men with the colours for four months in the year, and 65,000 during the remaining eight months, as the 30,000 men serving for four months and the 15,000 others would be sent on prolonged furlough.

Thus, the total period of military service being twelve years, Spain would, deduction being made for losses, dispose of a total of 670,000 trained soldiers, whereas under the present system she can only reckon on 240,000.

CORRESPONDENCE.

ALL-BRITISH CABLES.

To the Editor of the JOURNAL OF THE ROYAL UNITED SERVICE INSTITUTION.

SIR,—Several speakers at our discussion of this question last year were inclined to doubt my assertion that the United States recognised the principle that a submarine cable going from the territory of a belligerent to that of a neutral could only be cut in the belligerent's territorial waters. In the *Forum*, February, 1901, there is an article by Captain Stockton, U.S.N., summarising the new code of laws and usages of war upon the sea, which has been issued with the approval of the President to the United States Navy.

Captain Stockton says:—

"Telegraphic cables between points in the territory of an enemy or between our own territory and that of an enemy, are to be subject to such treatment as the necessities of war may require; but cables between the territory of an enemy and neutral territory may be interrupted within the territorial jurisdiction of the enemy. A submarine cable between two neutral points is to be held inviolable."

The above was my point exactly. If I were a French naval officer and had the chance of injuring Great Britain during war, by cutting a Pacific cable to Hawai, I should think twice before risking the resentment of the United States by cutting it anywhere outside the three-mile limit from Canadian territory. Possibly it may be done, but probably it will not. On the other hand, the All-British cable to Fanning Island can be cut anywhere, and the question of protecting the landing point at this barren island has not been considered.

Your obedient servant,

11th February, 1901. CARLYON BELLAIRS.

NAVAL AND MILITARY CALENDAR.

JANUARY, 1901.

1st (T.) Lord Hopetoun was sworn in as first Governor-General of the Australian Commonwealth.

" " Lord Kitchener reported that General Knox had captured 5 wagons and 6,000 rounds of ammunition from De Wet.

" " Sixty men of Prince Alfred's Guards were captured, and a British Convoy under 25 police were ambushed by the Boers near Kuruman.

" " The Chinese Court accepted the Note from the Powers.

2nd (W.) H.M. the Queen received Lord Roberts at Osborne on his return from South Africa, and conferred on him an Earldom and a K.G.

" " H.R.H. the Duke of York was appointed Colonel-in-Chief of the Royal Marines.

" " Naval Contingent and 5 guns were landed at Cape Town from H.M.S "Monarch."

" " Four Companies of Mounted Infantry left England for South Africa.

" " H.M.S. "Blenheim" commissioned at Chatham for China.

" " H.M.S. "Blake" arrived at Plymouth with relieved crew of "Empress of India."

3rd (Th.) A section of the Boers about Pretoria formed themselves into a Committee to bring the war to a conclusion.

4th (F.) Sir Alfred Milner was appointed Governor of the Transvaal and Orange River Colony.

5th (Sat.) General Babington engaged Commandos under Delarey and Steinkamp in the Rustenburg district, and drove them to the N.E. Commandant Dupreez was captured.

7th (M.) Lord Kitchener's Bodyguard had a severe engagement near Lindley. The British loss was 3 officers and 15 men killed, 2 officers and 20 men wounded.

" " The Boers made simultaneous attacks on the British positions on the Delagoa Bay Railway, but were driven off with loss. British casualties 1 officer and 29 men killed, 3 officers and 59 men wounded.

8th (T.) Boers unsuccessfully attack a British convoy north of Krugersdorp and lost 11 men killed.

" " An open letter exhorting the Boers still in arms to discontinue a futile and ruinous resistance was issued by the Central Peace Committee at Kronstad.

10th (Th.) The Boers attacked Machadodorp, but were beaten off.

" " Three agents of the Peace Committee were taken prisoners near Lindley. One, a British subject, was flogged and afterwards shot: the two others, burghers, were flogged, all by order of De Wet.

12th (Sat.) Joint Note from the Powers was signed by the Chinese envoys, Li Hung Chang and Prince Ching.

13th (S.) Colonel Brake surprised the natives at Dumbath, in Gambia, and totally defeated them.

14th (M.) The War Office called for more Yeomanry and Volunteers for South Africa.

15th (T.) H.M.S. "Blenheim" left Portsmouth for China.

" " H.M.S. "Diana" commissioned at Chatham for Mediterranean.

" " H.M.S. "Leander" paid off at Chatham from Pacific.

16th (W.) Wreck of H.M.S. "Sybille" in Lambart's Bay, South Africa.

" " Colonel Colville defeated the Boers with heavy loss at Vantondershoek.

" " At Johannesburg a Boer, who had broken the oath of neutrality, was sentenced to death.

18th (F.) It was officially announced that the strain of the past year had told upon H.M. the Queen's health, and that Her Majesty would abstain for the present from the transaction of business.

" " The Boers were repulsed with heavy loss near Ventersburg in the Standerton District.

19th (Sat.) It was announced that H.M. the Queen was suffering from great physical prostration, and that her condition caused grave anxiety. The members of the Royal Family gathered at Osborne.

20th (S.) Her Majesty's condition was reported to be more serious.

" " H.I.M. the German Emperor and H.R.H. the Duke of Connaught arrived in London from Germany, *en route* for Osborne.

21st (M.) The Boers unsuccessfully attacked Helvetia.

22nd (T.) Her Most Gracious Majesty Queen Victoria passed away at Osborne at 6.30 p.m., surrounded by Her children and grandchildren.

" " Launch of torpedo-boat destroyer "Osiotre" from the Forges et Chantiers de la Méditerranée at Havre for the Russian Navy.

23rd (W.) H.M. the King returned to London from Osborne, and at the Meeting of the Privy Council announced that he took the title of King Edward VII.

24th (Th.) H.M. King Edward VII. was proclaimed King of Great Britain and Ireland and Emperor of India.

25th (F.) Lord Kitchener reported that Generals Cunningham and C. Knox had been engaged with the enemy, and captured several prisoners.

27th (S.) H.M. King Edward VII. appointed H.I.M. the German Emperor a Field-Marshal in the British Army and presented him with the insignia of the Order of the Garter.

28th (M.) H.M. King Edward VII. invested the Crown Prince of Prussia with the Order of the Garter.

" " H.M. King Edward VII. was proclaimed in Pretoria as Supreme Lord of and over the Transvaal.

29th (T.) H.I.M. the German Emperor appointed H.M. King Edward VII. Colonel-in-Chief of the 1st Prussian Dragoon Regiment, of which H.M. the late Queen Victoria was Colonel-in-Chief.

31st (Th.) Launch of second-class cruiser "Bogatyr" from the Vulcan Yard, Stettin, for the Russian Navy.

FOREIGN PERIODICALS.

NAVAL.

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Talienwan." "The Wounds of the German Detachment under Admiral Seymour." "A Contribution to the Question of the New Tubing of Small-Tubed Water-Tube Boilers." "Discussion on Admiral Hopkins's Lecture." "A Few Naval Ideas for the Coming Century." "An English Officer's Criticism on Types of War-ships." "The French Naval Estimates for 1901 in the Chamber of Deputies."

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NOTICES OF BOOKS.

Meine Erlebnisse und Erfahrungen im Boeren Kriege. By ADALBERT GRAF STERNBERG. Large post 8vo. Berlin: George Reimer, 1901.

The author, Count Sternberg, a retired cavalry officer in the Austrian service, has reproduced in book form the letters he sent home as war correspondent to a newspaper.

He first went to South Africa just after the Jameson Raid in 1896. This enabled him to see into matters on the Boer side, and to give a most interesting account of the leaders, the country, and the Boer organisation. He foresaw what was coming, and was then of opinion that both Republics could not put more than 30,000 men in the field, and that 150,000 British soldiers would conquer them. He gives vivid pictures of Kruger, Leyds, Reitz, Cronje, De Wet, and other commanders in the Boer Army, and tells the tale of his varied adventures with a lively *bonhommie* which is irresistible. Though he dwells, perhaps, rather too long over the number of bottles of champagne he consumed, and pathetically asks the reader to sympathise with him over his lost bottles of lager beer, which failed to reach him owing to their having, after a series of misadventures, been annexed by the enemy, we must remember the circumstances under which the letters were written, and his personal experiences and feelings give a zest to the narrative. This is told in a series of life-like pictures drawn with evident keenness of observation. It is doubtless a trustworthy, as well as a picturesque and amusing account of that part of the war that the author saw, while his general reflections are worth consideration.

The author travelled from Vienna to Constantinople and from Cairo to Pretoria in 1899. His description of the state of affairs in the Transvaal at that time is very graphic. He does justice to England in the following words:—"There can be no possible doubt that England was very patient, and is justified in the eyes of God and man as regards this war."

In Pretoria he made the personal acquaintance of Joubert, who had not, he says, the full confidence of the Boers, as he was for coming to an understanding with England, whereas Cronje, Botha, Pretorius, Prinsloo, and Delarey were all trusted leaders. There were 35,000 under arms. They had 40,000 Mausers, 15,000 Männlichers of old pattern, Martini-Henrys, and others. The Transvaalers had 45 guns of different types, and the Free Staters 18. Most of the foreign contingents belonged to the latter. His account of the state of discipline in the Boer armies is very curious. His picture of Reitz, "the greatest fanatic in the whole country," presents him as a Puritan of Puritans, with an indomitable will and energy for work:—"When the news of Colenso arrived, Reitz handed me the telegram without a word, and there was not a sign of triumph in Pretoria." His description of Oom Paul and of his autocratic system of Government is graphic and complete, and he characterises the whole machine as a model one for ruling the Boer element.

The author was in Bloemfontein for Christmas, 1899. He praises Steyn as an upright patriotic man who was more beloved by the Free Staters than Kruger in the

Transvaal. Steyn was told by Dr. Leyds that he had a projected invasion by the English since 1896 in his bureau, and that they would march by Bloemfontein into the Transvaal. This determined Steyn to declare war. He describes De Wet as a little, modest man with nothing of the general about him, and gives an interesting account of the siege of Kimberley, and the Jacobsdaal-Paardeberg campaign. There his war experiences ended, for he was taken prisoner by an outpost of the Essex Regiment and marched into Lord Kitchener's camp of 15,000 men. His account of his capture is most amusing. He warmly praises the courtesy of the British officers and the kindly sympathy of the men. He met General Wavell; Colonels Henry and Belfield; Majors Hume, Poore (the celebrated cricketer, he says), Williams, Davies, and many others, and was treated as if he had been a brother officer. He was much impressed with their high tone and manliness. But this does not prevent his criticising their tactics. He was not at Magersfontein, but was daily in conversation with those who had been, and he knew the ground well.

He cannot imagine, he says, why Lord Methuen kept 7,000 men in reserve. He must have known by that time that it was not the habit of the Boers to counter-attack. He met Colonel de Villebois-Mareuil with the Boer Army round Kimberley, who thought very highly of the English troops. He considered them first-class soldiers, especially the artillery, but did not think much of the leading. They had a most difficult task, however, in Natal. He knew Léon also. He says he warned Cronje that he would be surrounded, but the latter was obstinate and would not retreat in good time, as he despised the British. His staff did not keep a good look-out, and much confusion prevailed.

The author gives Lord Kitchener a high place as a general, and, notwithstanding their mistakes, thinks the British Army did wonders against such a foe as was never met with before, and probably never will be again. "No Continental Army," he says, "would have played the part better," and as regards practical equipment and technical smartness and readiness, he doubts if any other Army would have done so well.

Like all foreign critics he says the Boers failed because they could not take the offensive on a large scale. "The British despise the petty stratagems, the 'Indian tactics' of the Boers to which they often fall victims."

The Boer positions were, in reality, small fortresses, and could not be reconnoitred by a few men either at Colenso or at Magersfontein. He praises the engineers much, especially the railway service. "As fast as the Boers destroyed the lines they restored them again." The supply arrangements were not, he thinks, good.

The most important part of the book is that in which Count Sternberg gives the views he has formed from what he saw in the Boer War regarding the tactics of the future, which, he says, will be totally different from those prescribed at present in any European Army.

Our space does not admit of more than a cursory notice of the many points he brings forward, the chief of which are the following:—

1. The great increase in distances and intervals necessitated by modern fire-arms, and the tendency to increase the frontage and lessen the depth of troops.
2. The decrease in the size of units.
3. The absolute necessity of cover.
4. The increased importance of good individual shooting and judging distance.
5. The special skill in leading required and the high quality and training of the troops necessary.
6. The increased importance of mobility, which is worth more than numbers.

He thinks an Army Corps should consist of one Light and two Heavy Divisions. The former to be formed of Mounted Engineers, Light Artillery, such as pom-poms bicyclists, and four-horsed wagons, carrying from ten to fifteen infantrymen each. As much cavalry as possible, all well trained to fighting on foot, and mounted riflemen well-horsed ammunition wagons, and a *light* train.

These Divisions to be formed of picked men, to receive special training in peace and kept nearly on a war footing.

As a maximum he proposes a strength as under :—

Two regiments cavalry=eight squadrons.

One company mounted engineers.

Mounted riflemen as required.

Six battalions infantry, each with a cyclist company, in light wagons.

The minimum transport with ammunition and food, etc., in light wagons. The objects of these Light Divisions should be to seize and hold important positions, to make rapid flanking movements against the flanks and rear of the enemy.

The South African War has shown that numbers alone no longer play a decisive part, and that a carefully chosen position well held may tell in the balance against superior forces.

Orders can no longer be carried in battle by despatch riders. That means certain death. The field-telegraph and heliograph must be made use of. Therefore every officer must learn the use of these.

As regards the size of units, he thinks the company of 100 men is best, as an officer cannot in the present day command more than 30 men in action. The strain on his brain as well as on his personal courage is enormous.

Double rank under fire as in Germany and Austria is an absurdity. Men must learn to creep and stalk the enemy as a hunter does, as soon as they approach his position. Standing up or kneeling to fire is ridiculous. No shot should ever be fired without good aim. Men under fire are nervous and shoot to quiet themselves. This must be checked by fire discipline. Volley and mass firing in action spoil the shooting of the men. More attention must be given to individual shooting. All reservists must therefore be compelled to keep up their shooting. The money spent thereon will be well laid out.

The immense frontage occupied in modern battle will induce leaders to entrench, so that they may, when they see their opportunity, creep forward and break through the defenders' line. We must be on our guard against simulated retreats to draw us into a trap. The Boers taught us that.

All deployments for attack must be made out of fire, and the advance thence in wide extended order, no matter how great the distance. Individual intelligence, forethought, and initiative must be inculcated and exercised in peace-training.

Night must be utilised to reinforce troops which in open ground cannot be done by day. Well-conducted night attacks are of great advantage. Actual entrenching in attack is very difficult to carry out, the men's hands shake after using their tools, and they cannot shoot. Good use of ground, as it is, has become more than ever of importance. Woods should only be occupied at the outer edges, as artillery make the interior untenable if occupied, but waste their ammunition on it if left. Individual skirmishers should avoid grouping behind scrub. It always draws fire. Nullahs and straight-cut trenches afford better cover. Hills should not be occupied, they are easily surrounded.

The author has much to say about cavalry, which, coming from an Austrian Cavalry officer, is worth attention. He says that the British Cavalry obtained but slight results in South Africa, though its *raison d'être* seemed in that country more than ever justified. Until Mounted Infantry was attached to it, its effect was not formidable. He thinks the idea of great cavalry actions at the beginning of a great war a false one :—"We think we will send our Cavalry masses forward to reconnoitre and force on a fight. The defenders, if they are wise, will let them come on, then surround and cut them off."

The idea of Cavalry Reconnaissance on a large scale is obsolete. "A single civilian on a bicycle could find out more about the enemy than a whole Cavalry Division."

Reconnaissance must be carried on by specially trained patrols with a portable field-telegraph and possibly wireless telegraphy apparatus. To counteract these, small Infantry Detachments must be scattered about to shoot down all patrols. Mounted

Rifles are the best Reconnoitrers. It is useless to sacrifice Cavalry for this. Cavalry is by no means without its uses, but it must give up its excess of polish. The well-known order of Benedek on the eve of Königgrätz: "Buttons are to be polished," still has its influence. The automaton must disappear, the intelligence be awakened. This by no means signifies slacker discipline. All orders must be obeyed like lightning. The future Cavalryman must both ride and shoot well. Even in Cavalry *v.* Cavalry, dismounted action will come into play. The horses must be more highly trained to stand perfectly still when dismounted. This is of more importance than perfect grooming. As regards pace: a long trot fatigues the horse. It should be alternated with the canter, and the Boers have two practical paces which rapidly get over the ground without fatigue. The slower pace is trotting with the hind legs and walking very quickly with the fore legs.[1] The second pace is a "Pass Gallop": The horse trots with the hind legs and canters with the fore legs. This is not so fatiguing as either the trot or gallop, and the horses learn it easily.

As regards dress, it must be more comfortable, looser, and more practical. The English have wisely one dress for war and a show dress for peace. All should follow suit. An open jacket in hot weather and a large waistcoat with many pockets as the Boers wear is best. Every mounted man should carry 300 rounds as they did.

As regards artillery, the author says he is no expert, but he does not see the use of the preliminary artillery bombardment which is *de rigeur*. It hits nothing and it discovers your position. There should be very light guns with cavalry for pursuit, the cavalry being chiefly used for their protection. He thinks the Maxim-Nordenfelt 5-centimetre (1·97-inch) Q.F. gun the best for this, and for guns of position (which he thinks indispensable) the French Creusot guns. He says a modern gun with fixed ammunition and hydraulic break is worth six guns of old pattern. The British Shrapnel were of little effect and the Lyddite was a failure. Artillery has made less progress than the other arms in the present day.[2] Too much artillery is a mistake. In 1870 artillery outmatched the rifle. To-day it is the rifle that wins the day.

As regards infantry the author reiterates his conviction that good individual shooting and judging distance will decide a war. He says the English never hit anything at all. Instead of fixed targets at fixed distances, etc., each company should have its rifle range and a section should be shooting daily all the year round. He believes in special sharpshooters, because some men will never learn to shoot though much money be spent on them.

He respects the principle of national armies, and they may do for the lines of communication or to reinforce the regular trained forces, but for fighting in the present day these are indispensable, and he would, like the Greeks and Romans, have "corps d'élite." The great difficulty of feeding large armies in the present day and the enormous quantity of transport required make it more desirable than ever to have few but specially trained troops.

The author is of opinion that in order to march well, shoot well, and to be thoroughly trained, the infantry soldier should remain as long as possible with the Colours. Then the best shots should be selected for training as mounted infantry.

Every man should carry a spade with a sharp point, which could be used in case of need as a bayonet.[3] The English had bad spades with a short haft and broad flat shovels. It is indispensable to have some kind of a covering at night. These could be carried in company wagons.[4]

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[1] I think this used to be called "tripling" when I was at the Cape, and is a sort of run.—TRANSLATOR.

[2] The author's views in regard to artillery are peculiar.—TRANSLATOR.

[3] The trowel-bayonet was tried in our Service many years ago and rejected.—TRANSLATOR.

[4] This is already arranged for in our service equipment.—TRANSLATOR.

The author considers the Männlicher magazine rifle of little use now, the Mauser, 1895,[1] the best of all modern rifles. It is the smallest in calibre (?). All the wounded, however, should be made prisoners, otherwise they soon are in condition to fight again. Many officers wounded at Magersfontein on the 11th December fought at Koodoesberg on the 7th February.

Traction engines were made use of where practicable. They are of great use in war. We have but indicated briefly the chief points the author makes in his criticisms. Space fails for an examination of these. He especially warns us against that offensive spirit which alone, it is said, leads to victory, unless accompanied by the utmost care in guarding all communications.

An English translation of Count Sternberg's book is in course of preparation by Messrs. Longmans Green & Co., so all officers will be able to read this entertaining account for themselves.

The Tactics of To-day. By Major C. E. CALLWELL, R.A. (Author of "The Effect of Maritime Command on Land Campaigns since Waterloo.") Edinburgh and London: William Blackwood & Sons, 1900.

The impressions conveyed to the mind of a notoriously capable soldier during the actual progress of a war in which he himself is taking part could scarcely fail in commanding the attention that should certainly be bestowed upon Major Callwell's excellent little book. From beginning to end there is obvious common sense at the root of the deductions made and of the opinions expressed. Some of Major Callwell's readers, including the present writer, may differ with him upon sundry matters of detail, but a general acceptance of his arguments as a whole may confidently be predicted.

On his avoidance of the pitfalls, into which so many have hopelessly fallen, the author has been singularly successful. He neither asserts that the wholesale adoption of Boer methods is a *sine quâ non* to future success in war, nor that because European troops like our own are incapable of acquiring the individuality that has rendered the Boers so often successful, therefore we must abandon all idea of learning generally useful lessons from the present campaign. Instead of wasting time upon either of these opposing fallacies, Major Callwell goes straight to the point, showing that it has been owing to the possession of magazine rifles, smokeless powder, and long-range guns, rather than to their own special characteristics, that the Boers have been enabled to make so good a defence. In the operations of the Natal campaign: "Success depended upon hard fighting, not upon skilfully directed manœuvres extending over a wide area. And the fact that our opponents entrenched themselves in well-chosen positions, offering no facilities for flanking movements, and defied us to turn them out, prevented their extraordinary mobility on the battle-field from influencing the course of the struggles to a paramount extent." At the earlier stages of the campaign we practically ignored or failed to realise the tactical revolution brought about by modern weapons and explosives. Perhaps we have now learned better; but, at all events, few will disagree with Major Callwell's conclusion that: "The tactical lessons of the Boer War are in the main applicable to regular warfare anywhere." Those who decline to accept this dictum will be only such as are incapable of distinguishing between general and particular questions. The fact that the Boers are what they are has enabled them to secure advantages that cannot be reaped by soldiers bred in a state of artificial civilisation, and in whose case it is attempted by special training to supply the place of natural instinct. Thus it comes that in applying the lessons of the Boer War to regular warfare against the troops of a wholly civilised Power, we must be guided by the general teachings of the campaign rather than by the incidents in it that have arisen solely in consequence of particular conditions

[1] This is the Belgian pattern ·276 calibre. Many of the Boers had the Spanish Mauser.

that will not obtain elsewhere. The Boer has no living counter-part, but the backwoodsman of North America represented a somewhat similar class of fighter. A wild life revives the instincts and keen senses of primitive man ; hence the secret of Boer superiority in making the best use of the ground and weapons at his disposal. With smokeless powder the facilities for concealment have been greatly increased, and as the Boers have shown themselves capable of utilising such advantages to the utmost, so also does the regular soldier to some extent participate, with the result that : " The disappearance of black powder has exerted a far more potent influence in moulding tactics into a new shape than the increased power and accuracy, or the rapid fire, of the modern rifle and gun."

The "counter-position" already recommended by other writers for use in the "attack" has its value proclaimed also by Major Callwell, who is fully alive to its extreme importance and, moreover, draws attention to the paramount necessity for every forward movement being covered by the fire of other troops held in position for that purpose. The idea of a "general line" attempting to clear the way by its own fire as it advances is, it may be hoped, buried for ever. Major Callwell lays great stress upon this, and points out that even within the company itself there must be no attempt at gaining ground unless some portion—even a single section—is retained to keep up the fire. Upon this matter, however, Major Callwell seems to have been guilty of some ambiguity, and exposes himself to being misunderstood. He leaves it open to the unthinking to conclude that he advocates the advance of a number of alternate units with the attendant certainty of those in advance more or less masking the fire of those left in rear to cover them. He would have done well to adopt, as an ideal, Prince Kraft's rule that the force directed against a single objective should be divided for the purpose of "rushes" into only two echelons.

Treated purely as an ideal—although founded upon the teachings of actual practice (the attack on Le Bourget)—this rule furnishes an excellent guide, and for drill purposes should be strictly adhered to ; but upon the battle-field we must be content that those who can gain ground shall do so, and subsequently that the units which have covered the advance shall in their turn seize other opportunities and be similarly supported by their previously successful comrades.

On dealing with cavalry, Major Callwell goes so far as to declare that "Modern conditions have rendered the shock tactics of this arm obsolete." He would have been more correct, it would seem, in contenting himself with an assertion that the opportunities for shock tactics will be more rare in future, whilst admitting at the same time that, when a chance actually offers, the result should be more than ever decisive ; if the cavalry are well led and ride straight at the critical moment. It is in the very effectiveness of fire-arms that the cavalry will find the source of their occasional opportunities. Armed with the Brown Bess, unshaken infantry of good quality and unsurprised could not be overthrown by cavalry ; but infantry that have been long exposed to modern fire must be liable to such complete disorganisation as to offer a tempting chance to the watchful cavalry leader who has his squadrons in the right place at the right time.

On artillery subjects Major Callwell is, perhaps, at his best, and it will gratify many readers to find so able an expert admitting the expediency of "using ground" to the extent even of dispersing single guns in concealed positions. Five years ago a writer in the *Broad Arrow* asked whether the time had not come for artillery to take a hint from the infantry and sometimes "skirmish" with their guns in preference to an unvarying system of mass tactics. That writer was generally regarded as a lunatic. Now, at last, a really competent gunner has practically adopted these same advanced views, and it is greatly to be hoped that his opinions may prevail.

The available space will not admit of any further remarks beyond the expression of a fervent hope that Major Callwell's really valuable book may be not only read but studied as it deserves.

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GEORGE HAMILTON, 1st EARL OF ORKNEY, K.T.

Premier Field-Marshal of England.

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